RS160-E2/CS3

1U Rackmount Barebone Server

User Guide

E2232

V2.0
August 2005

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Notices

Federal Communications Commission Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with manufacturer's instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

WARNING! The use of shielded cables for connection of the monitor to the graphics card is required to assure compliance with FCC regulations. Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

Canadian Department of Communications Statement

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

This Class A digital apparatus complies with Canadian ICES-003.

Safety information

Electrical Safety

- Before installing or removing signal cables, ensure that the power cables for the system unit and all attached devices are unplugged.
- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing any additional devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your dealer.

Operation Safety

- Any mechanical operation on this server must be conducted by certified or experienced engineers.
- Before operating the server, carefully read all the manuals included with the server package.
- Before using the server, make sure all cables are correctly connected and the power cables are not damaged. If any damage is detected, contact your dealer as soon as possible.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Place the server on a stable surface.

This product is equipped with a three-wire power cable and plug for the user's safety. Use the power cable with a properly grounded electrical outlet to avoid electrical shock.

Lithium-Ion Battery Warning

CAUTION! Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

CD-ROM Drive Safety Warning

CLASS 1 LASER PRODUCT

Heavy System

CAUTION! This server system is heavy. Ask for assistance when moving or carrying the system.

About this guide

Audience

This user guide is intended for system integrators, and experienced users with at least basic knowledge of configuring a server.

Contents

This guide contains the following parts:

1. **Chapter 1: Product Introduction**

   This chapter describes the general features of the server, including sections on front panel and rear panel specifications.

2. **Chapter 2: Hardware setup**

   This chapter lists the hardware setup procedures that you have to perform when installing or removing system components.

3. **Chapter 3: Installation options**

   This chapter describes how to install optional components into the barebone server.

4. **Chapter 4: Motherboard information**

   This chapter gives information about the motherboard that comes with the server. This chapter includes the motherboard layout, jumper settings, and connector locations.

5. **Chapter 5: BIOS information**

   This chapter tells how to change system settings through the BIOS Setup menus and describes the BIOS parameters.

6. **Chapter 6: Driver installation**

   This chapter provides instructions for creating and configuring RAID, and installing the necessary drivers for different system components.

Conventions

To make sure that you perform certain tasks properly, take note of the following symbols used throughout this manual.

WARNING: Information to prevent injury to yourself when trying to complete a task.

CAUTION: Information to prevent damage to the components when trying to complete a task.

IMPORTANT: Instructions that you MUST follow to complete a task.

NOTE: Tips and information to aid in completing a task.

References

Refer to the following sources for additional information, and for product and software updates.

1. **ASUS NCL-DSR1 motherboard user guide**
   This manual contains detailed information about the ASUS NCL-DSR1 motherboard.
2. **ASUS Server Web-based Management (ASWM) user guide**
   This manual tells how to set up and use the proprietary ASUS server management utility.
3. **ASUS websites**
   The ASUS websites worldwide provide updated information for all ASUS hardware and software products. Refer to the ASUS contact information.

Chapter 1

This chapter describes the general features of the chassis kit. It includes sections on front panel and rear panel specifications.

Product introduction

1.1 System package contents

The items in the ASUS RS160-E2/CS3 product package vary depending on the model your purchased. Check your package for the standard items listed in the following table.

Package items
✓ ASUS R11 1U rackmount chassis with: • ASUS NCL-DSR1 motherboard • 500W power supply • SCSI backplane • Slim optical drive • Slim floppy drive • System fans • Device fans • 3 x hot-swap HDD trays • Pre-connected device/power cables
✓ CPU heatsinks
✓ SCSI cable
✓ Rackmount rail kit
✓ Bundled CDs • RS160-E2/CS3 drivers and utilities CD • CA Anti-virus software CD
✓ User guide

Contact your dealer immediately if any of the items is damaged or missing.

1.2 System specifications

The ASUS RS160-E2/CS3 is a 1U barebone server system featuring the ASUS NCL-DSR1 motherboard. The server supports dual Intel® Xeon™ processors, and includes the latest technologies through the chipsets embedded on the motherboard.

Chassis	Rackmount 1U (R11)
Motherboard	ASUS NCL-DSR1
Chipset	North Bridge: Intel® E7520 Memory Controller Hub (MCH) South Bridge: Intel® ICH5R
Processor	Supports dual Intel® Xeon™ processors with Extended Memory 64-bit Technology (EM64T) and Hyper-Threading Technology
Memory	8 x 240-pin DDR sockets for up to 16GB system memory Supports DDR2 400MHz registered ECC DIMMs Supports dual-channel memory architecture
LAN	2 x Broadcom® BMC5721 PCI Express Gigabit LAN controllers Supports PCI Express 1.0a interface
VGA	ATI RAGE-XL PCI-based VGA controller Supports 8MB display memory
Expansion slot	1 x full length/full height PCI-X 133MHz/64-bit slot (PCI-X 1.0) 1 x low profile PCI-X 100MHz/64-bit slot
Storage	Adaptec AIC-7902W PCI-X U320 SCSI controller supports: - 2 x SCSI channels - Support HostRAID RAID 0,1 and 0+1(A RAID 0+1 set requires four identical hard disk drives , and only support external SCSI Channel.) - 3 x Hot-swap SCSI HDD Tray
Management	ASUS Server Web-based Management (ASWM)
Hardware monitors	Voltage, temperature, and fan speed monitoring Automatic System Restart (ASR) feature
Power supply	500W power supply, 100V~240V, 50Hz~60Hz
Dimensions	670 mm (l) x 445 mm (w) x 43.6 mm (h)
Weight	11.25 (not include CPU, Memory and HDD)

1.3 Product Features

Advanced thermal technology enables Dual-Xeon processor architecture and Industry-Leading specifications in a 1U platform.

Powerful 1U solution

To provide excellent performance and reliability, the RS160-E2/CS3 supports the dual-Intel® Xeon platform, and incorporated the Intel E7520 MCH and ICH5R ICH chipsets. Industry-leading specifications such as DDRII 400 ECC Registered memory, built-in two gigabit high speed internet ports and two PCI-X connectivity are also accommodated in the RS160-E2 1U server barebone system.

Best utilization for ASWM (Asus System Web-based Management)

ASWM designed for RS160-E2/CS3 can monitor the system operation temperature, power voltage, fan speed...etc and can support various operating systems such as list below.

Windows® :

2000 Advance Server, 2000 Server, 2003 Server, 2003 Enterprise

Linux®:
Red Hat Linux Advance Server 3.0, Red Hat Linux Advance Server 3.0 (EM64T), SeSE Linux® Enterprise Server 9.0

Cool computing Environment

With its advanced heat-dissipation design, the RS160-E2/CS3 successfully resolved the critical thermal problem, which has made two processors in the limited space of a 1U server chassis seemed impossible in the past. The RS160-E2/CS3 adopted an thermal design that included four 56mm x 28mm fans, four 28mm x 28mm fans and two copper heat sinks for optimal ventilation to ensure cool and stable operation.

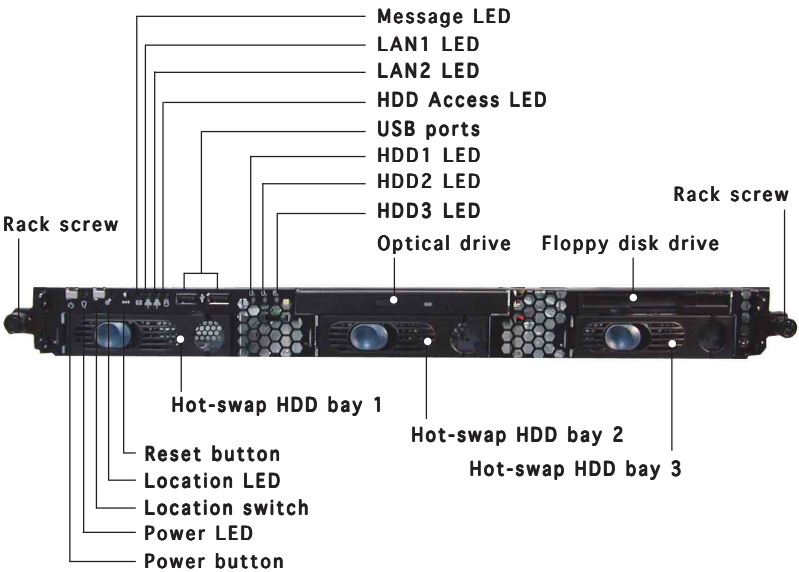
Advanced Replacement Service

Advanced Replacement Service (ARS) offers direct delivery of components to value added resellers (VAR) and system integrators (SI), who assembled server systems based on barebone systems and motherboards manufactured by ASUS. The mission of ARS is to provide peace of mind to our customers that are building high-performance and complex servers by offering technical support they can count on. Compared to conventional RMA (return material authorization) services that require customers to first return defective parts to distributors and involve a long list of complicated procedures, ARS significantly saves customers' precious time and eliminates the potential financial damage from delayed maintenance.

1.4 Front panel features

The barebone server displays a simple yet stylish front panel with easily accessible features. The power and reset buttons, LED indicators, location switch, optical drive, and two USB ports are located on the front panel.

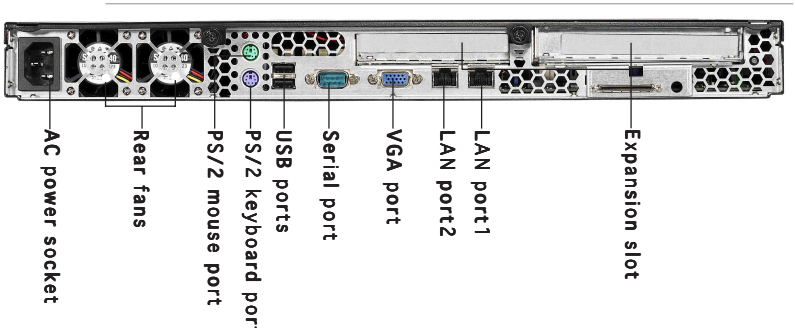
Refer to section "1.6.1 Front panel LEDs" for the LED descriptions.



1.5 Rear panel features

The rear panel includes the expansion slot, system power socket, and rear fans. The middle part includes the I/O shield with openings for the rear panel connectors on the motherboard.

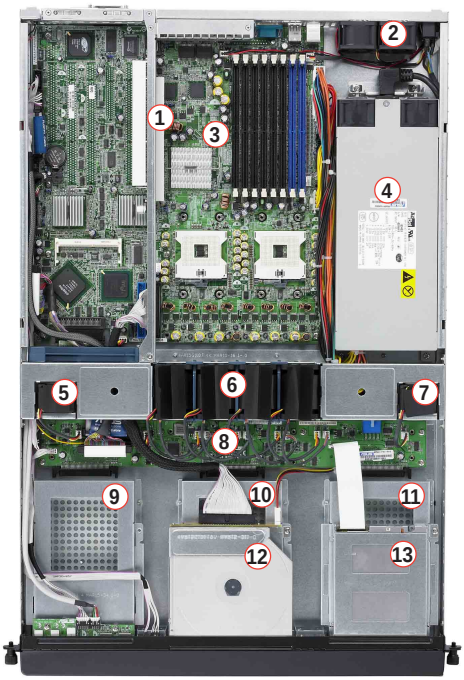
The ports for the PS/2 keyboard, PS/2 mouse, USB, VGA, and Gigabit LAN do not appear on the rear panel if motherboard is not present.



Refer to section "1.6.2 Rear panel LEDs" for the LED descriptions.

1.6 Internal features

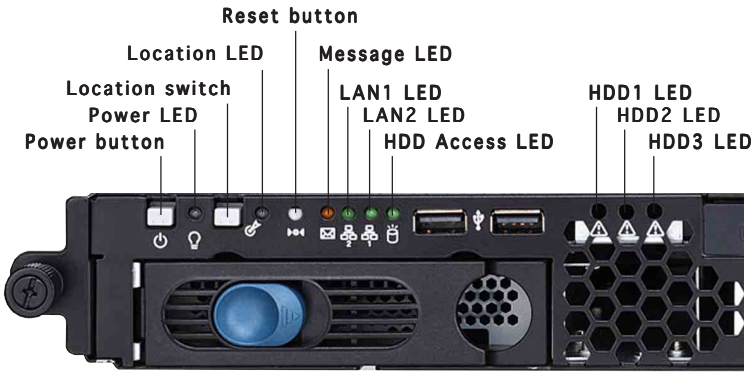
The barebone server includes the basic components as shown.



1. PCI-X riser card bracket
2. Rear fans
3. ASUS NCL-DSR1 motherboard
4. Power supply
5. Device fan
6. System fans (8 fans)
7. Device fan
8. SCSI backplane
9. Hot-swap HDD tray 1
10. Hot-swap HDD tray 2
11. Hot-swap HDD tray 3
12. Slim optical drive
13. Slim floppy drive

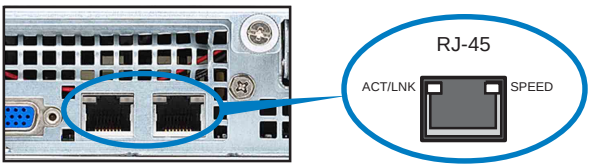
1.7 LED information

1.7.1 Front panel LEDs



LED	Display status	Description
Power LED	ON	System power ON
HDD Access LED	OFF Blinking	No activity Read/write data into the HDD
HDD LED1/2/3	ON OFF	HDD is present No HDD present
Message LED	OFF ON	System is in normal condition; no incoming event ASWM detects a system problem; (Log in to ASWM to identify and resolve)
Location LED	OFF ON	Normal status Location switch is pressed (Press the location switch again to turn off)
LAN LEDs	OFF Blinking ON	No LAN connection LAN is transmitting or receiving data LAN connection is present

1.7.2 Rear panel LEDs



ACT/LINK LED		SPEED LED	
Status	Description	Status	Description
OFF	No link	OFF	10Mbps connection
Green	Linked	Orange	100Mbps connection
Blinking	Linking	Green	1000Mbps connection

Chapter 2

This chapter lists the hardware setup procedures that you have to perform when installing or removing system components.

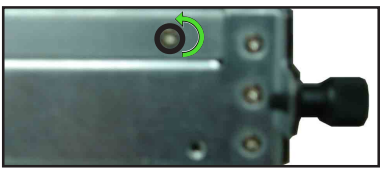
ASUS AP1600R-E2 (CS3)

Hardware setup

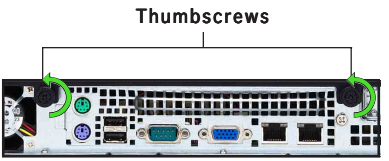
2.1 Chassis cover

2.1.1 Removing the cover

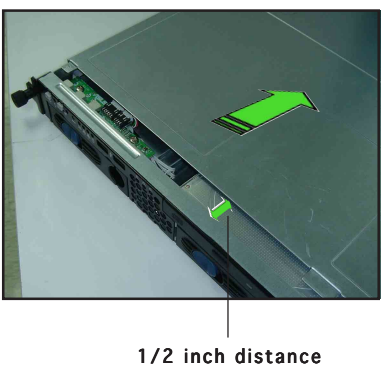
1. Use a Phillips screwdriver to remove the screw on each front end of the top cover.



2. Loosen the two thumbscrews on the rear panel to release the top cover from the chassis.



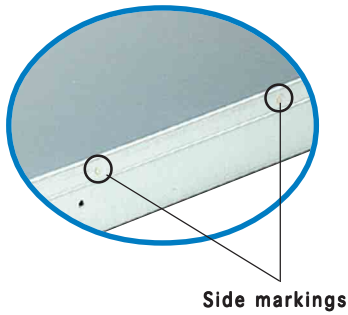
3. Firmly hold the cover and slide it toward the rear panel for about half an inch until it is disengaged from the chassis.



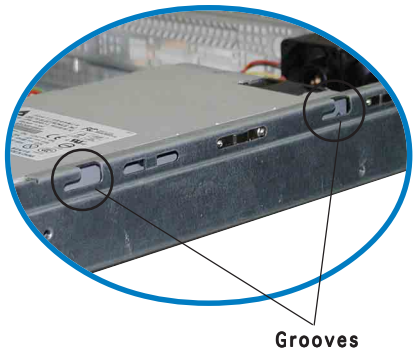
4. Lift the cover from the chassis.

2.1.2 Installing the cover

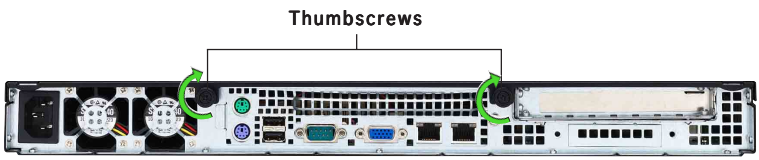
1. Position the cover on top of the chassis with the thumbscrews on the rear, and leaving a gap of about half an inch from the front panel.



2. Make sure that the side markings on the cover (two on each side) are aligned to the grooves on the chassis.

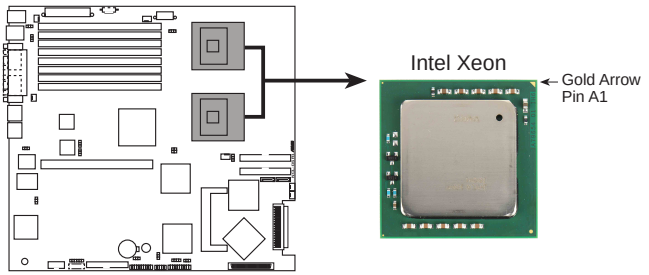


3. Slide the cover toward the front until it snaps in place.
4. Tighten the thumbscrews on the rear to secure the cover.



2.2 Central Processing Unit (CPU)

The motherboard comes with surface mount 604-pin Zero Insertion Force (ZIF) sockets. The sockets are designed for the Intel® Xeon™ processor in the 604-pin package with 1 MB L2 cache. The new generation Xeon™ processor supports 800 MHz system bus and Extended Memory 64-bit Technology (EM64T).



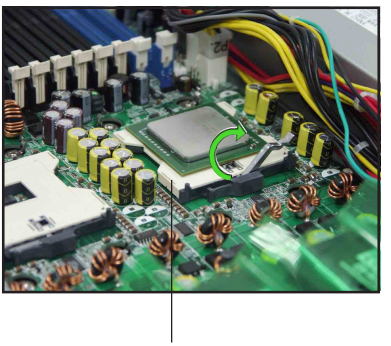
NCL-DSR1 CPU Socket 604

The motherboard supports either one or two CPUs. If you are installing only one CPU, you MUST install it in CPU socket 1.

2.2.1 Installling a CPU

To install the CPUs:

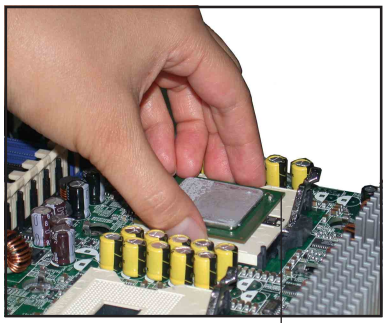
1. Locate the CPU sockets on the motherboard. Flip up the socket lever and push it all the way to the other side.



Socket for CPU1

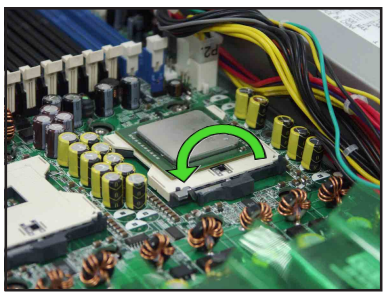
3. Position the CPU above the socket as shown.
4. Carefully insert the CPU into the socket until it fits in place.

The CPU fits only in one correct orientation. DO NOT force the CPU into the socket to prevent bending the pins and damaging the CPU!



Marked corner (gold arrow)

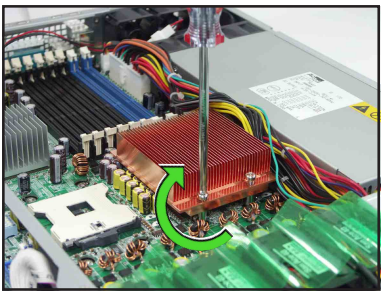
5. Carefully push down the socket lever to secure the CPU. The lever clicks on the side tab to indicate that it is locked.
6. Apply the thermal interface material (thermal grease) to the top of the CPU. This thermal grease should come with the CPU package.
7. Repeat steps 1 to 6 if you wish to install a second CPU.



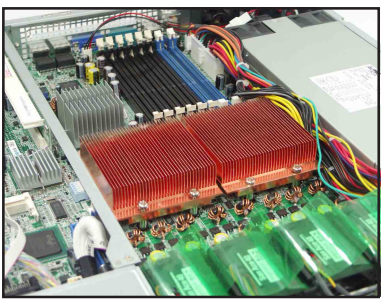
2.2.2 Installing the CPU heatsink

To install the CPU heatsink:

1. Carefully place the heatsink on top of the installed CPU.
2. Twist each of the four screws with a Philips (cross) screwdriver just enough to attach the heatsink to the motherboard. When the four screws are attached, tighten them one by one to completely secure the heatsink.



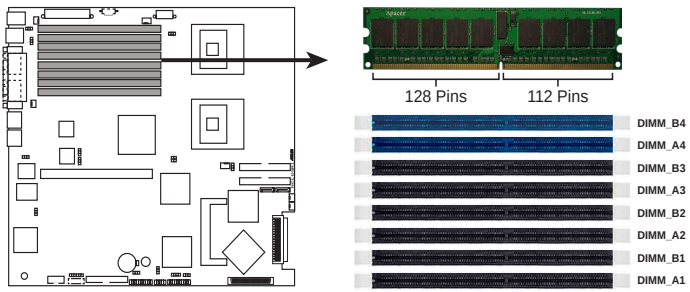
3. Follow steps 1 and 2 to install the second CPU heatsink.



2.3 System memory

2.3.1 Overview

The motherboard comes with four Double Data Rate 2 (DDR2) Dual Inline Memory Modules (DIMM) sockets.



NCL-DSR1 240-pin DDR2 DIMM sockets

2.3.2 Memory configurations

You may install 256 MB, 512 MB, 1 GB, and 2 GB registered ECC DDR2 DIMMs into the DIMM sockets.

- Always install DIMMs with the same CAS latency. For optimum compatibility, it is recommended that you obtain memory modules from the same vendor. Refer to the DDR2 Qualified Vendors List on the ASUS website for details.
- Due to chipset resource allocation, the system may detect less than 16 GB system memory when you install eight 2 GB DDR2 memory modules.
- Three DDR2 DIMMs intalled into any three memory sockets will function in single-channel mode.
- If installing only one pair of DIMMs, install them in sockets DIMM_B4 and DIMM_A4.

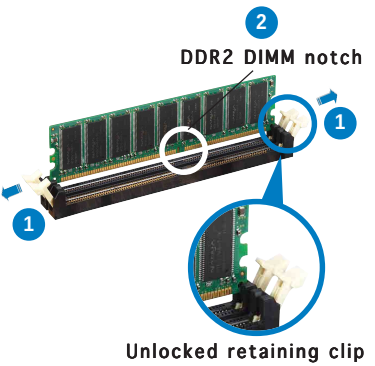
Mode	DIMM_B4	DIMM_A4	DIMM_B3	DIMM_A3	DIMM_B2	DIMM_A2	DIMM_B1	DIMM_A1
Single-channel	✓							
Dual-channel	✓	✓						
	✓	✓	✓	✓				
	✓	✓	✓	✓	✓	✓		
	✓	✓	✓	✓	✓	✓	✓	✓

✓ Populated with DIMM

2.3.3 Installing a DIMM

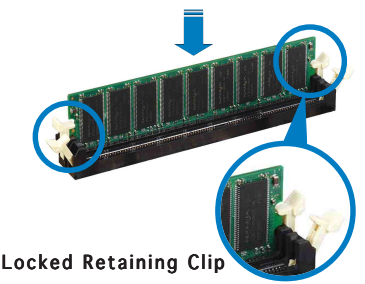
Make sure to unplug the power supply before adding or removing DIMMs or other system components. Failure to do so may cause severe damage to both the motherboard and the components.

1. Unlock a DIMM socket by pressing the retaining clips outward.
2. Align a DIMM on the socket such that the notch on the DIMM matches the break on the socket.



A DDR DIMM is keyed with a notch so that it fits in only one direction. DO NOT force a DIMM into a socket to avoid damaging the DIMM.

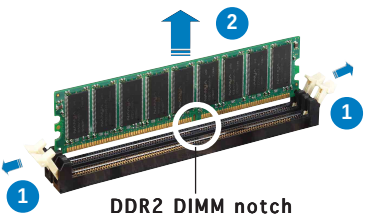
3. Firmly insert the DIMM into the socket until the retaining clips snap back in place and the DIMM is properly seated.



2.3.4 Removing a DIMM

Follow these steps to remove a DIMM.

1. Simultaneously press the retaining clips outward to unlock the DIMM.



Support the DIMM lightly with your fingers when pressing the retaining clips. The DIMM might get damaged when it flips out with extra force.

2. Remove the DIMM from the socket.

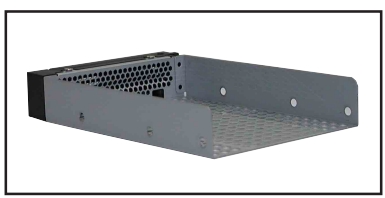
2.4 Hot-swap hard disk drives

To install a hot-swap HDD:

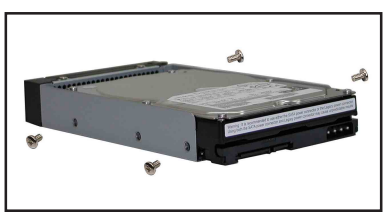
1. Release a drive tray by pushing the spring lock to the right, then pulling the tray lever outward. The drive tray ejects slightly after you pull out the lever.

2. Firmly hold the tray lever and pull the drive tray out of the bay.

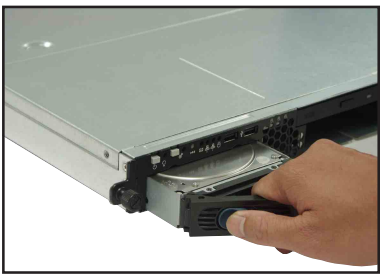
3. Take note of the drive tray holes. Each side has three holes to fit different types of hard disk drives. Use two screws on each side to secure the hard disk drive.



4. Place a hard disk drive on the tray, then secure it with four screws.

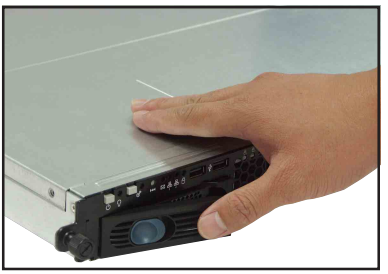


5. Carefully insert the drive tray and push it all the way to the depth of the bay until just a small fraction of the tray edge protrudes.



When installed, the SCSI connector on the drive connects to the SCSI connector on the backplane. Refer to section “2.7.2 SCSI backplane” for illustration.

6. Push the tray lever until it clicks, and secures the drive tray in place. The drive tray is correctly placed when its front edge aligns with the bay edge.
7. Repeat steps 1 to 6 if you wish to install a second and/or third drive.



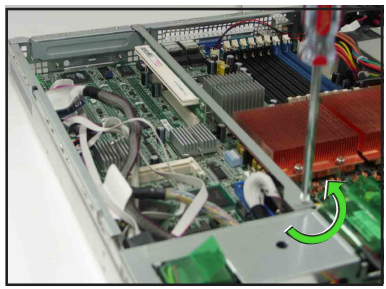
2.5 Expansion slot

The barebone server comes with a riser card bracket installed on the 64-bit expansion slot. You need to remove the bracket if you wish to install a PCI-X expansion card.

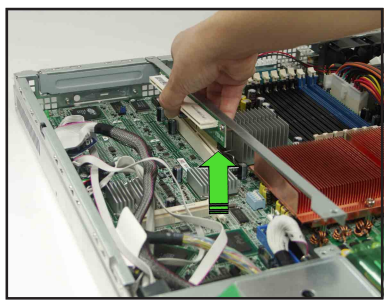
2.5.1 Installing expansion cards

To install a short expansion card:

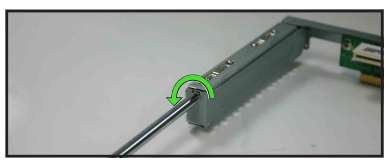
1. Use a Phillips (cross) screwdriver to remove the screw that secures the riser card to the chassis.



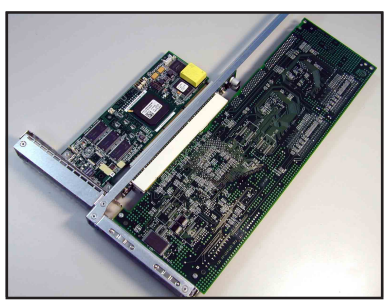
2. Firmly hold the riser card bracket, then pull it up to detach it from the PCI-X slot on the motherboard.



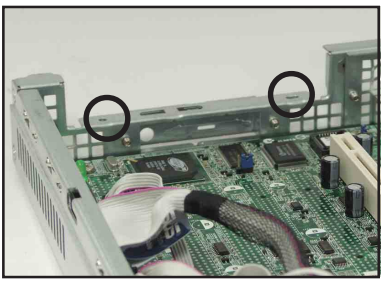
3. Remove the screw that secures the slot metal cover.

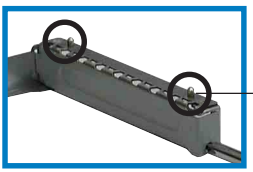


4. Install PCI-X cards to the bracket as shown, then secure the card with a screw.



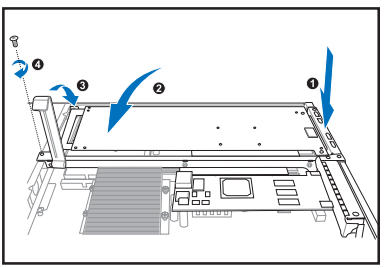
5. Take note of the holes on the riser card bay. The two pegs on the riser card bracket should match these holes to ensure that the bracket is properly in place.



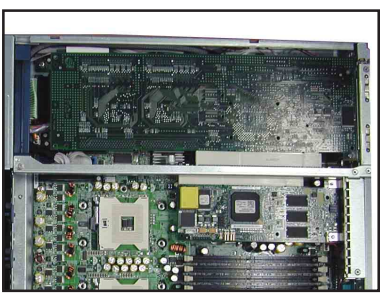


Peg on the riser card bracket

6. Install the riser card bracket with the card into the PCI-X slot on the motherboard.
7. Make sure that the golden connectors completely fit the slot and the bracket aligns with the rear panel.



8. Secure the riser card bracket to the chassis with the screw that you removed earlier.
9. Connect the cable(s) to the card, if applicable.



2.5.2 Configuring an expansion card

After installing the expansion card, configure the it by adjusting the software settings.

1. Turn on the system and change the necessary BIOS settings, if any. See Chapter 5 for information on BIOS setup.
2. Assign an IRQ to the card. Refer to the following tables.
3. Install the software drivers for the expansion card.

Standard interrupt assignments

IRQ	Priority	Standard Function
0	1	System Timer
1	2	Keyboard Controller
2	N/A	Programmable Interrupt
3*	11	Communications Port (COM2)
4*	12	Communications Port (COM1)
5*	13	Sound Card (sometimes LPT2)
6	14	Floppy Disk Controller
7*	15	Printer Port (LPT1)
8	3	System CMOS/Real Time Clock
9*	4	ACPI Mode when used
10*	5	IRQ Holder for PCI Steering
11*	6	IRQ Holder for PCI Steering
12*	7	PS/2 Compatible Mouse Port
13	8	Numeric Data Processor
14*	9	Primary IDE Channel
15*	10	Secondary IDE Channel

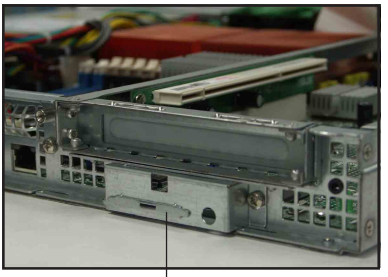
* *These IRQs are usually available for ISA or PCI devices.*

IRQ assignments for this motherboard

	INTA#	INTB#	INTC#	INTD#	REQ#	GNT#
ICH5R IDE contrl.	PIRQC#	—	—	—	—	—
ICH5R SATA contrl.	PIRQC#	—	—	—	—	—
ICH5R SMBus contrl.	PIRQB#	—	—	—	—	—
ICH5R USB UHCI contrl. #1	PIRQA#	—	—	—	—	—
ICH5R USB UHCI contrl.#2	PIRQD#	—	—	—	—	—
ICH5R USB 2.0 EHCI contrl.	PIRQH#	—	—	—	—	—
AIC-7902W SCSI contrl.	PXH2_A_0	PXH2_A_1	—	—	PXH2_A_0	PXH2_A_0
Zero-Channel RAID sockets	PXH2_A_2	—	—	—	PXH2_A_1	PXH2_A_1
ATI RAGE XL video contrl.	PIRQB#	—	—	—	REQ1H#	GNT1#
PCIX slot 1 (64-bit)	PXH1_B_0	PXH1_B_1	PXH1_B_2	PXH1_B_3	PXH1_B_0	PXH1_B_0

2.6 External SCSI port

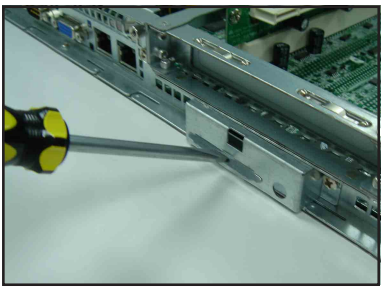
The barebone system includes a slot on the rear panel for the external SCSI port. You need to install the SCSI cable that came with your system package if you wish to connect additional SCSI drives.



External SCSI slot

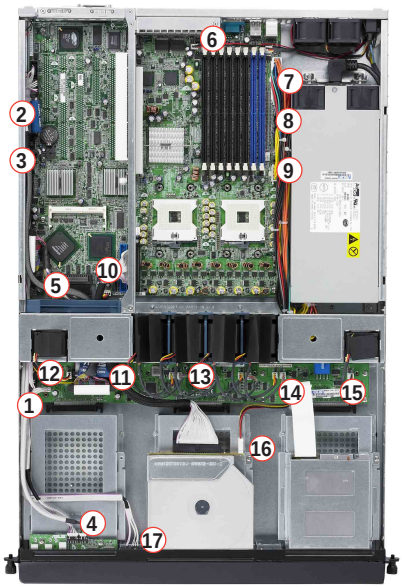
2.6.1 Removing the slot cover

To remove the external SCSI slot cover, insert the end of a flat screw driver into the hole at the center of the slot cover to knock it out.



The slot opening appears as shown after you have removed the slot cover.

2.7 Cable connections

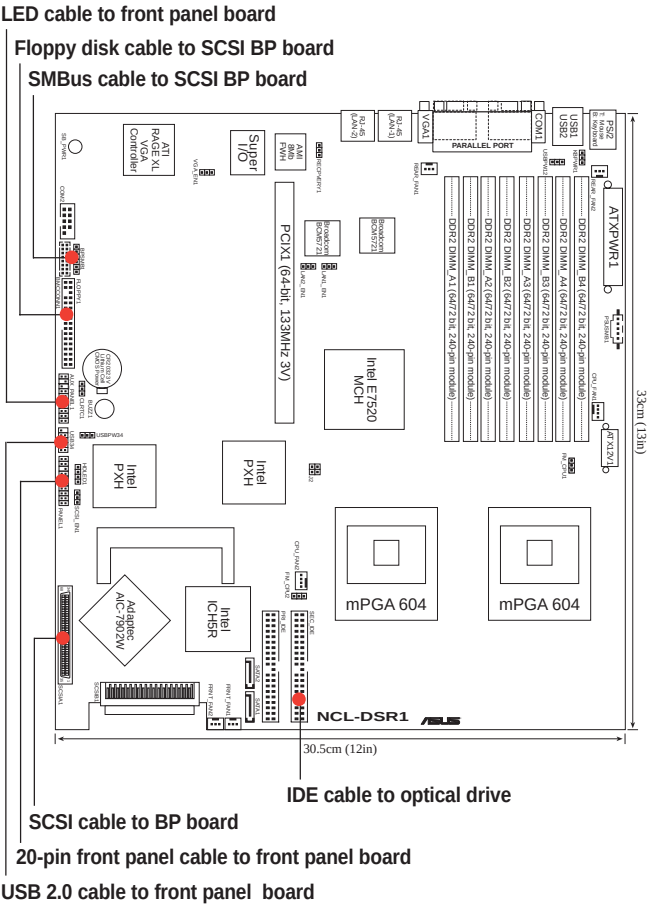


Pre-connected system cables

Description	From	To
1. Backplane SMBus cable	MB BPSMB1 conn.	BP J1 conn.
2. Floppy disk cable	MB FLOPPY1 conn.	BP FLOPPY1 conn.
3. LAN activity LED / Locator LED cable	MB AUX_PANEL1 conn.	Front panel board
4. USB cable	MB USB34 conn.	Front panel board
5. SCSI cable	MB SCSIA1 conn.	BP U1 conn.
6. Rear fan cable	Rear fan	MB REAR_FAN conn.
7. 24-pin SSI power cable	Power supply	MB ATXPWR1 conn.
8. 5-pin I2C power cable	Power supply	MB PSUSMB1 conn.
9. 8-pin SSI power cable	Power supply	MB ATX12V1 conn.
10. Secondary IDE connector	MB SEC_IDE conn.	Optical drive
11. Fan interface cable	MB FRNT_FAN1 conn.	BP FANIN conn.
12. Device fan cable	Device fan	BP FAN1 conn.
13. System fan cables	8 system fans	BP FAN2~9 conn.
14. Device fan cable	Device fan	BP FAN10 conn.
15. Slim floppy disk cable	BP U23 conn.	Floppy disk
16. Slim 4-pin ODD power cable	Power supply	Optical drive
17. HDD LED cable	BP J2 conn.	Front panel HDD LED slots

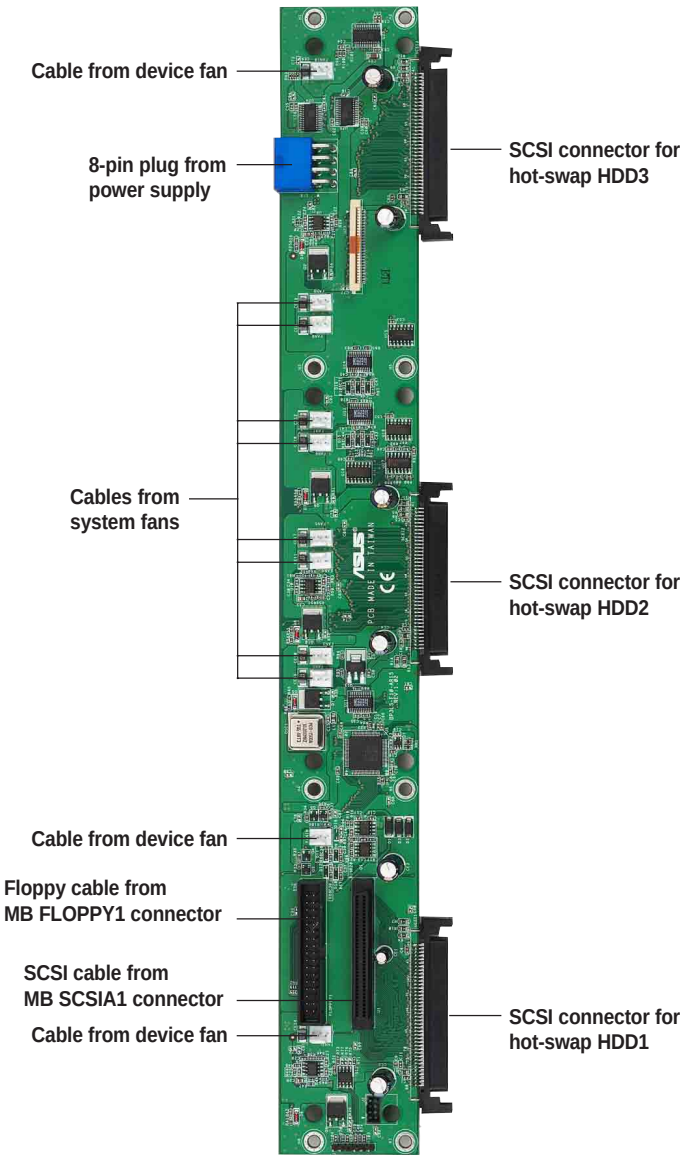
2.7.1 Motherboard

The following illustration describes the cables for the specific connectors on the motherboard.



2.7.2 SCSI backplane

The following illustration describes the cables/devices that are connected to the SCSI backplane board.


Cable from device fan
8-pin plug from power supply
SCSI connector for hot-swap HDD3
Cables from system fans
SCSI connector for hot-swap HDD2
Cable from device fan
Floppy cable from MB FLOPPY1 connector
SCSI cable from MB SCSIA1 connector
Cable from device fan
SCSI connector for hot-swap HDD1

2.8 Removable components

You may need to remove previously installed system components when installing or removing system devices, or when you need to replace defective components. This section tells how to remove the following components:

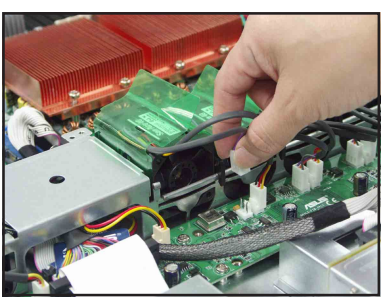
1. System/Device fans
2. Power supply module
3. Optical drive
4. Floppy disk drive

2.8.1 System/Device fans

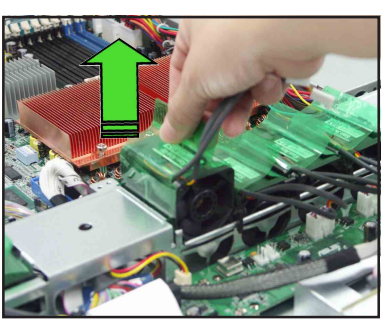
The eight (8) system fans and two device fans come in a screw-less design.

To uninstall a fan or pair of system fans:

1. Disconnect the corresponding fan cable from the connector on the backplane board.

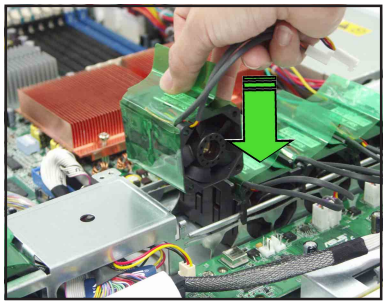


2. Hold the flap of the plastic wrapping on the fan, then gently pull the fan out of the compartment.

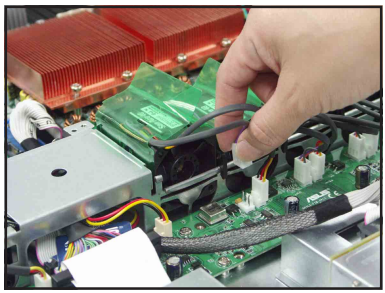


To install a fan or pair of system fans:

1. Hold the plastic flap and position the fan over a fan compartment. Carefully insert the fan, or pair of fans, until it fits in place.



2. Connect the corresponding fan cable from the connector on the backplane board.

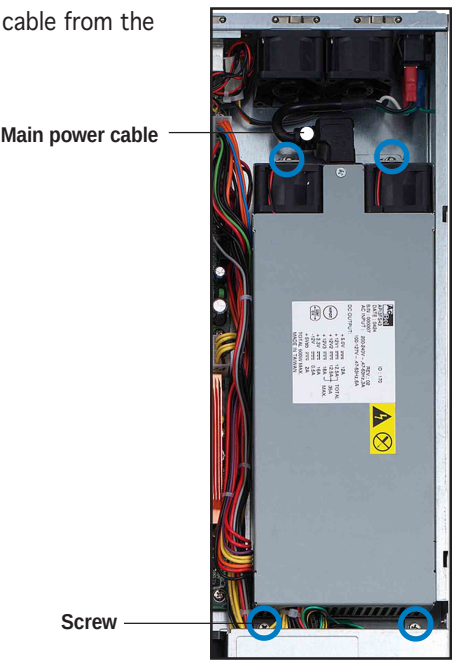


2.8.2 Power supply module

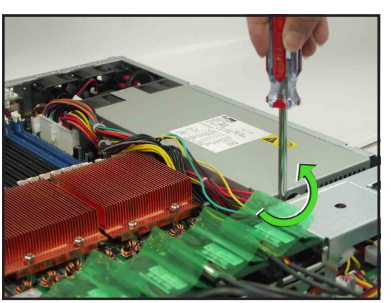
To remove the power supply module:

1. Disconnect all the power supply plugs connected to all the system devices. Refer to section “2.7 Cable connections” for the locations of pre-connected cables.

2. Disconnect the main power cable from the rear of the power supply.



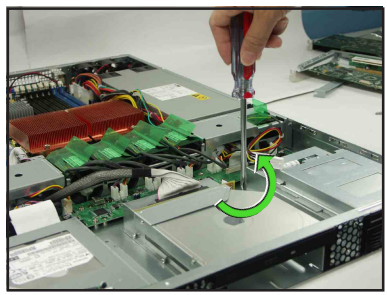
3. Use a Phillips screwdriver (cross) to remove the four screws that secure the power supply to the chassis.
4. Carefully lift the power supply module from the chassis.



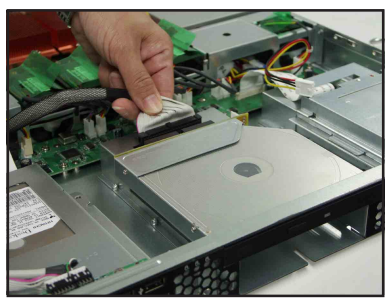
2.8.3 Optical drive

To uninstall the slim optical drive:

1. Use a Phillips screwdriver (cross) to remove the screw that secures the drive.



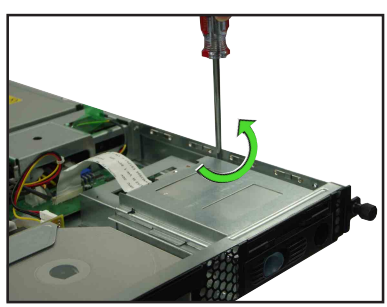
2. Disconnect the IDE cable and the 4-pin power plug from the connectors on the back of the drive.
3. Carefully slide the optical drive inward for about half an inch, then lift it out of the bay.
4. Remove the screws that secure the optical drive to its metal bracket.



2.8.4 Floppy disk drive

To uninstall the floppy disk drive:

1. Use a Phillips screwdriver (cross) to remove the screw that secures the drive.
2. Disconnect the slim floppy cable from the connector on the back of the drive.
3. Carefully slide the floppy disk drive inward for about half an inch, then lift it out of the bay.
4. Remove the screws that secure the floppy disk drive to its metal bracket.



Chapter 3

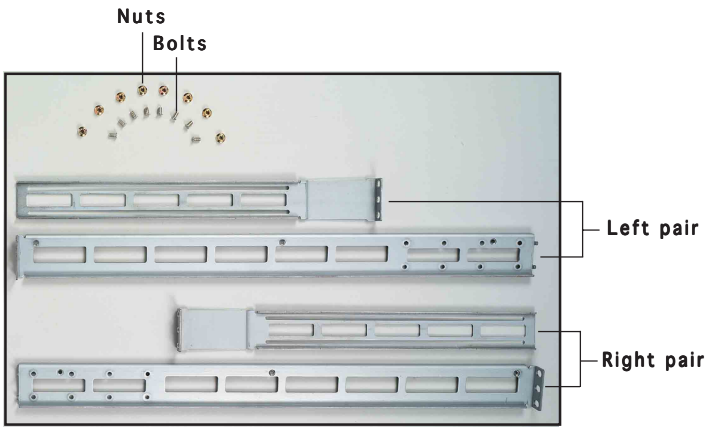
This chapter describes how to install the optional components and devices into the barebone server.

ASUS RS160-E2/CS3

Installation options

3.1 Rackmount rail kit items

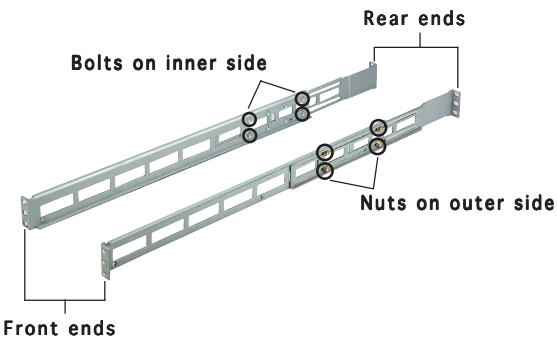
If you have the rackmount rail kit, it contains two pairs of rails (one pair for each side of the barebone system), and eight (8) pairs of nut-and-bolt type screws.



3.2 Rack rails assembly

To assemble the rack rails:

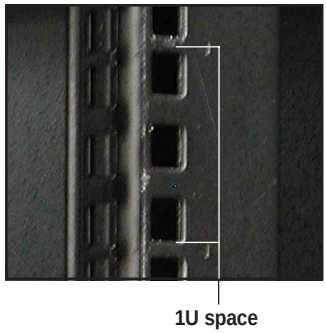
1. Determine the depth of the rack where you wish to install the system.
2. Match one long and one short rail to your desired length, and fix them together using four (4) pairs of nuts and bolts.
3. Repeat step 2 to assemble the other rail pair.



3.3 Attaching the rails to the rack

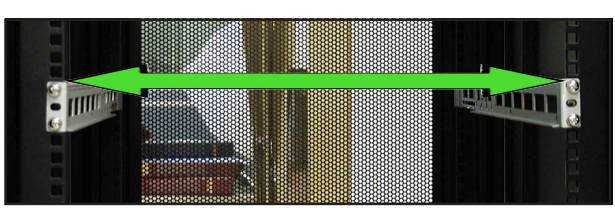
To attach the rails to the rack:

1. Select one unit of space (1U) on the rack where you wish to install the barebone server.
2. Remove the screws from the 1U space on the rack front.



3. Align the front end holes of a rack rail pair to the 1U space.
4. Drive in two screws on the outer holes to secure the front end.

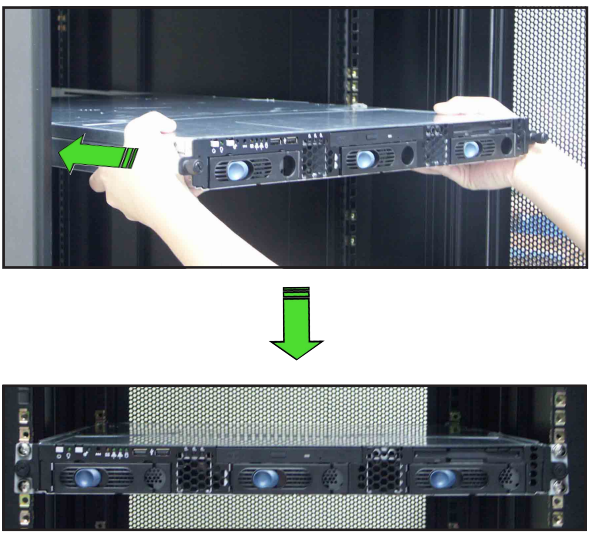
5. Find the **rear 1U space** that corresponds to the **front 1U space** where you attached the rail.
6. Remove the screws from the rear 1U space, and align the rear end holes.
7. Drive in two screws on the outer holes to secure the rear end.
8. From the rack front, find the corresponding 1U space for the second rail pair.
9. Repeat steps 2 to 7 to attach the second rail pair. When properly installed, the rack rails appear as shown.



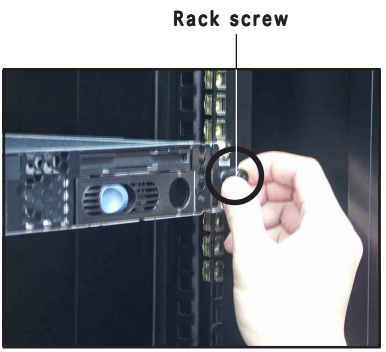
3.4 Rackmounting the server

To mount the server to the rack:

1. Firmly hold the server on both sides and insert the rear panel side to the front end of the rack rail, then carefully push the server all the way to the back until the front panel fits the front end of the rack, and the rack screws on the server match the middle hole on the rack.



2. Tighten the two rack screws to secure the server to the rack.

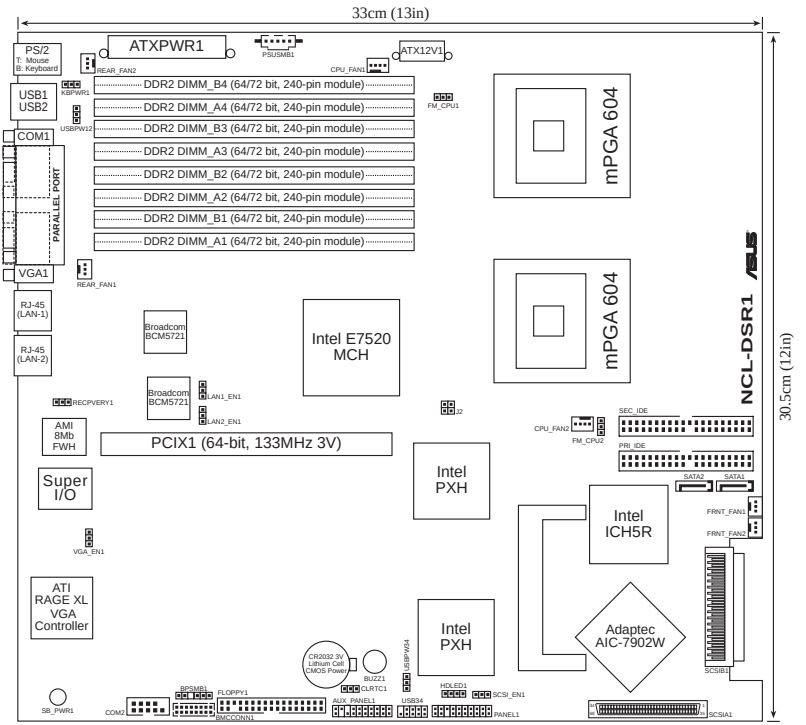


Chapter 4

This chapter includes the motherboard layout, and brief descriptions of the jumpers and internal connectors.

Motherboard info

4.1 Motherboard layout



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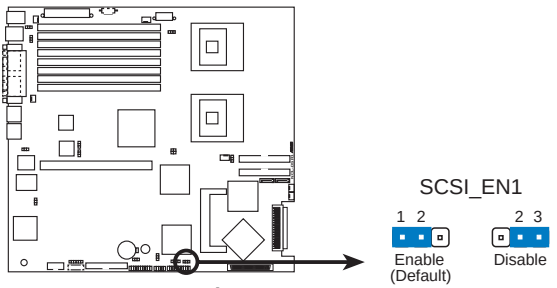
4.2 Jumpers

1. SCSI controller setting (3-pin SCSI_EN1)

This jumper allows you to enable or disable the onboard Adaptec AIC-7902W SCSI U320 controller. Set to pins 1-2 to activate the SCSI feature, and support RAID configurations.



NCL-DSR1 SCSI setting

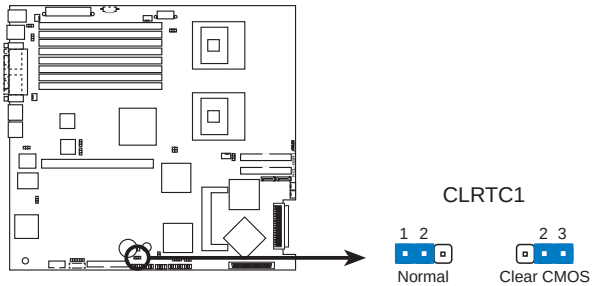
2. Clear RTC RAM (CLRTC1)

This jumper allows you to clear the Real Time Clock (RTC) RAM in CMOS. You can clear the CMOS memory of date, time, and system setup parameters by erasing the CMOS RTC RAM data. The onboard button cell battery powers the RAM data in CMOS, which include system setup information such as system passwords.

To erase the RTC RAM:

1. Turn OFF the computer and unplug the power cord.
2. Remove the onboard battery.
3. Move the jumper cap from pins 1-2 (default) to pins 2-3. Keep the cap on pins 2-3 for about 5~10 seconds, then move the cap back to pins 1-2.
4. Re-install the battery.
5. Plug the power cord and turn ON the computer.
6. Hold down the <Del> key during the boot process and enter BIOS setup to re-enter data.

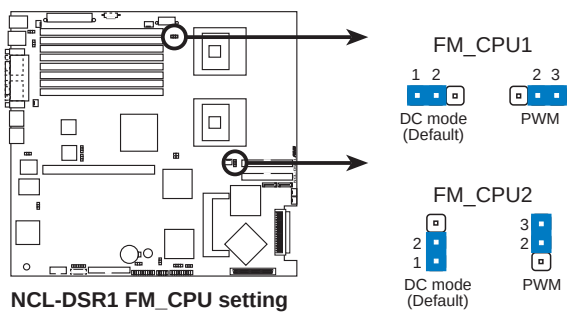
Except when clearing the RTC RAM, never remove the cap on CLRTC jumper default position. Removing the cap will cause system boot failure!



NCL-DSR1 Clear RTC RAM

3. CPU fan pin selection (3-pin FM_CPU1, FM_CPU2)

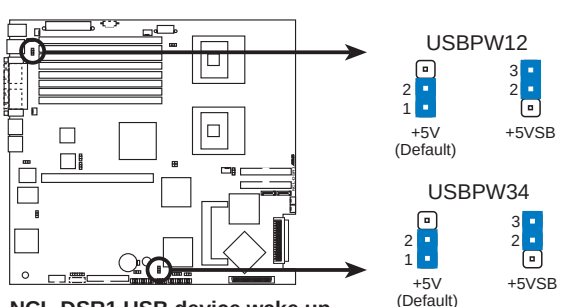
These jumpers allow you to connect either a 3-pin or a 4-pin CPU fan cable plug to the CPU fan connectors (CPU_FAN1, CPU_FAN2). Set these jumpers to pins 1-2 if you are using a 3-pin fan cable plug, or to pins 2-3 if you are using a 4-pin plug.



NCL-DSR1 FM_CPU setting

4. USB device wake-up (3-pin USBPW12, USBPW34)

Set these jumpers to +5V to wake up the computer from S1 sleep mode (CPU stopped, DRAM refreshed, system running in low power mode) using the connected USB devices. Set to +5VSB to wake up from S3 and S4 sleep modes (no power to CPU, DRAM in slow refresh, power supply in reduced power mode).

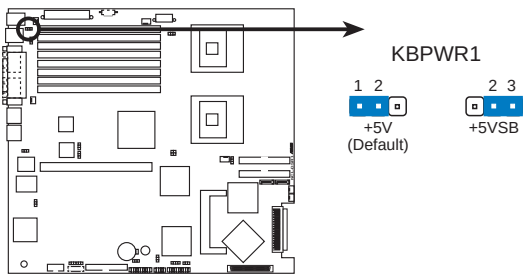


NCL-DSR1 USB device wake up

- The USB device wake-up feature requires a power supply that can provide 500mA on the +5VSB lead for each USB port; otherwise, the system would not power up.
- The total current consumed must NOT exceed the power supply capability (+5VSB) whether under normal condition or in sleep mode.

5. Keyboard power (3-pin KBPWR1)

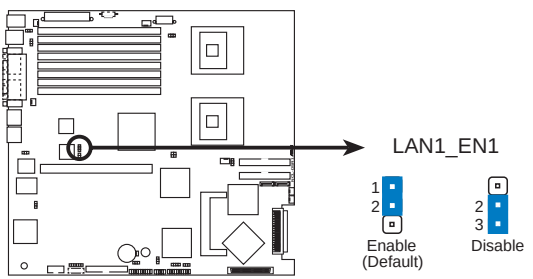
This jumper allows you to enable or disable the keyboard wake-up feature. Set this jumper to pins 2-3 (+5VSB) to wake up the computer when you press a key on the keyboard (the default is the Space Bar). This feature requires an ATX power supply that can supply at least 1A on the +5VSB lead, and a corresponding setting in the BIOS.



NCL-DSR1 Keyboard power setting

6. Gigabit LAN1 controller setting (3-pin LAN1_EN1)

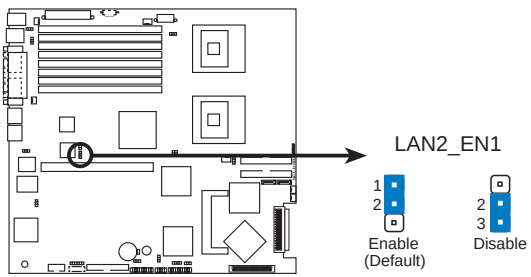
This jumper allows you to enable or disable the Intel® 82547GI Gigabit LAN controller (CSA) that controls the LAN1 port. Place a jumper cap on pins 1-2 to activate the Gigabit LAN1 controller.



NCL-DSR1 LAN1_EN setting

7. Gigabit LAN2 controller setting (3-pin LAN2_EN1)

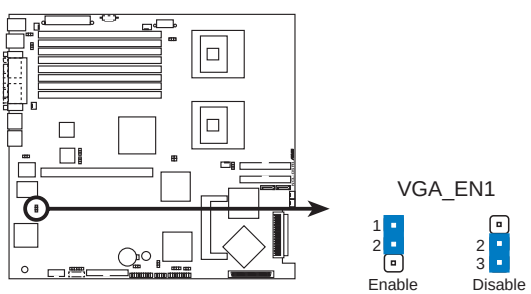
This jumper allows you to enable or disable the Intel® 82541GI Gigabit LAN controller (32-bit) that controls the LAN2 port. Place a jumper cap on pins 1-2 to activate the Gigabit LAN2 controller.



NCL-DSR1 LAN2_EN setting

8. Integrated graphics controller (3-pin VGA_EN1)

This jumper allows you to enable or disable the onboard graphics controller.



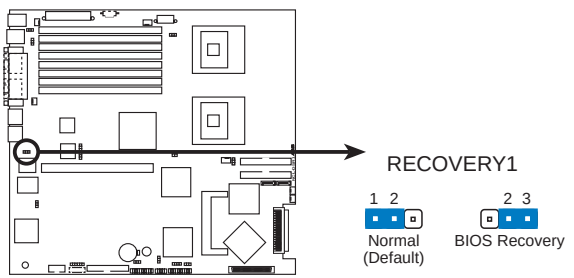
NCL-DSR1 VGA setting

9. Force BIOS recovery (3-pin RECOVERY1)

This jumper allows you to update or recover the BIOS settings when it gets corrupted or destroyed.This jumper allows you to update/recover the BIOS quickly.

To update the BIOS:

1. Prepare a floppy disk that contains the latest BIOS for the motherboard (xxxx-xxx.RM).
2. Set the jumper to pins 2-3.
3. Insert the floppy disk, then turn on the system to update the BIOS.
4. Shut down the system.
5. Set the jumper back to pins 1-2.
6. Turn on the system.



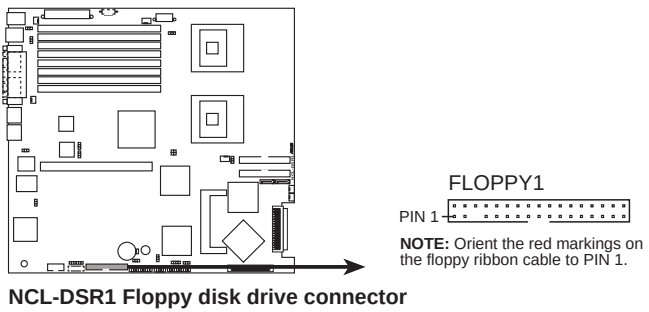
NCL-DSR1 BIOS recovery setting

4.3 Connectors

1. Floppy disk drive connector (34-1 pin FLOPPY1)

This connector is for the provided floppy disk drive (FDD) signal cable. Insert one end of the cable to this connector, then connect the other end to the signal connector at the back of the floppy disk drive.

Pin 5 on the connector is removed to prevent incorrect cable connection when using a FDD cable with a covered Pin 5.

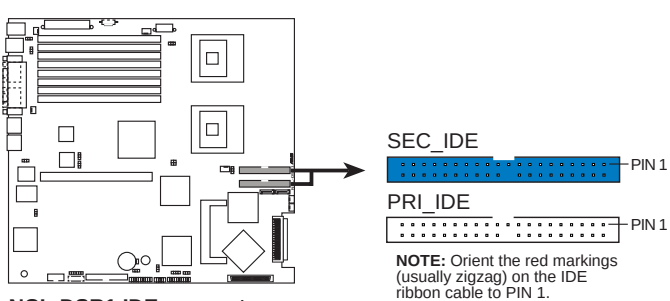


NCL-DSR1 Floppy disk drive connector

2. IDE connectors (40-1 pin PRI_IDE, SEC_IDE)

These connectors are for Ultra DMA 100/66/33 signal cables. The Ultra DMA 100/66/33 signal cable has three connectors: a blue connector for the primary IDE connector on the motherboard, a gray connector for an Ultra DMA 100/66 IDE master device (hard disk drive), and a black connector for an Ultra DMA 100/66/33 IDE slave device (optical drive/ hard disk drive). If you install two hard disk drives, you must configure the second drive as a slave device by setting its jumper accordingly. Refer to the hard disk documentation for the jumper settings.

- Pin 20 on the IDE connectors are removed to match the covered hole on the Ultra DMA cable connector. This prevents incorrect insertion when you connect the IDE cable.
- Use the 80-conductor IDE cable for Ultra DMA 100/66/33 IDE devices.



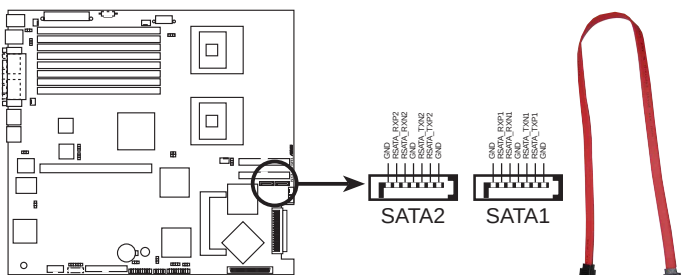
NCL-DSR1 IDE connectors

3. Serial ATA connectors (7-pin SATA1, SATA2)

These connectors are for the Serial ATA signal cables for Serial ATA hard disk drives.

If you installed Serial ATA hard disk drives, you can create a RAID 0 or RAID 1 configuration with the Adaptec® HostRAID™ technology supported by the Intel® 6300ESB South bridge chip.

These connectors are set to **Standard IDE** mode by default. In **Standard IDE** mode, you can connect Serial ATA boot/data hard disk drives to these connectors. If you intend to create a Serial ATA RAID set using these connectors, set the **Configure S-ATA as RAID** item in the BIOS to [Yes]. See page 5-17 for details.



NCL-DSR1 SATA connectors

Important notes on Serial ATA

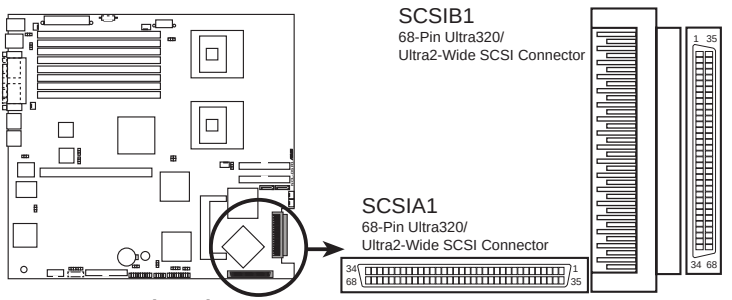
- You must install Windows® 2000 Service Pack 4 or the Windows® XP Service Pack 1 before using Serial ATA hard disk drives. The Serial ATA RAID feature (RAID 0/RAID 1) is available only if you are using Windows® 2000/XP.
- Use only two Serial ATA RAID connectors for each RAID 0 or RAID 1 set.
- When using the connectors in **Standard IDE** mode, connect the primary (boot) hard disk drive to the SATA1 or SATA2 connector. Refer to the table below for the recommended SATA hard disk drive connections.

Serial ATA hard disk drive connection

Connector	Setting	Use
SATA1	Master	Boot disk
SATA2	Slave	Data disk

4. Ultra320 SCSI connectors (two 68-pin SCSIA1, SCSIB1)

This motherboard comes with the Adaptec® AIC-7902 SCSI U320 controller that support two 68-Pin Ultra320 SCSI connectors, one for each of the two channels. Each channel can support a maximum of 15 devices as specified by Ultra320 standards.



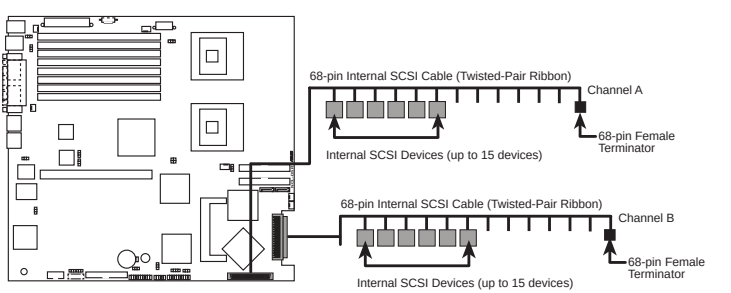
NCL-DSR1 Onboard SCSI connectors

SCSI Connection Notes

This motherboard has two 68-Pin Ultra320 SCSI connectors; one for each of the two channels.

The onboard SCSI chipset incorporates an advanced multimode I/O cell that supports both single-ended (SE), Ultra2, Ultra160, and Ultra320 devices. With Ultra320 devices, the SCSI bus platform performs at full Ultra320 speeds (up to 320MB/s) and extended cabling 12m (or 25m in a point-to-point configuration). When an SE device is attached, the bus defaults to an SE speed and 1.5m cable length.

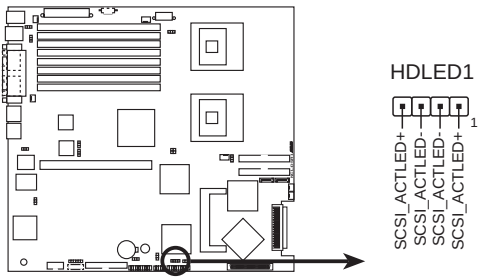
Connect SCSI devices as shown. Each channel should have only one type of SCSI standard (e.g. Ultra320, Ultra160, Ultra2, Ultra-Wide). Mixing SCSI devices on the same channel decreases performance of the slower device.



NCL-DSR1 SCSI connection example

5. Hard disk activity LED connector (4-pin HDLED1)

For some storage cards, such as SCSI card, with access signals for external LEDs, this connector allows the access signals to go through the front panel IDE_LED lead.

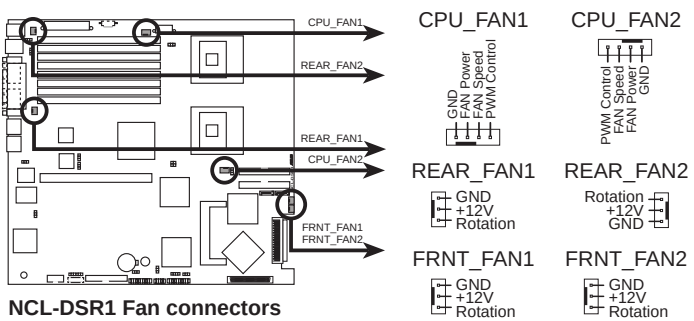


NCL-DSR1 SCSI/SATA card activity LED connector

6. CPU and system fan connectors (4-pin CPU_FAN1/2, 3-pin REAR_FAN1/2, FRNT_FAN1/2)

The fan connectors support cooling fans of 350 mA ~ 740 mA (8.88 W max.) or a total of 2.1 A ~ 4.44 A (53.28 W max.) at +12V. Connect the fan cables to the fan connectors on the motherboard, making sure that the black wire of each cable matches the ground pin of the connector.

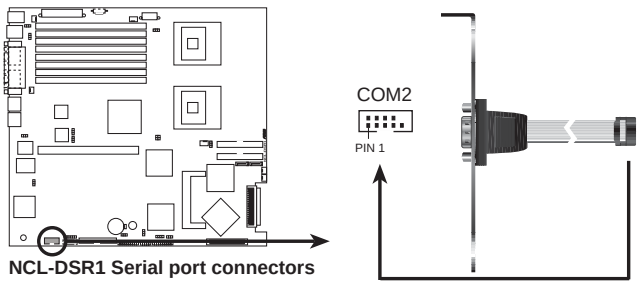
Do not forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components. These are not jumpers! Do not place jumper caps on the fan connectors!



NCL-DSR1 Fan connectors

7. Serial port connector (10-1 pin COM2)

This connector is for a serial (COM) port. Connect the serial port module cable to this connector, then install the module to a slot opening at the back of the system chassis.



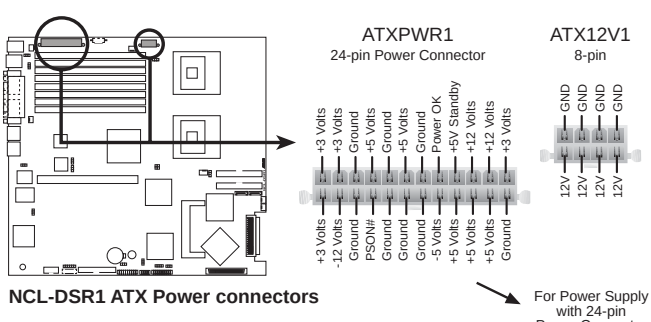
NCL-DSR1 Serial port connectors

The serial port module is purchased separately.

8. SSI power connectors (24-pin ATXPWR1, 8-pin ATX12V1)

These connectors are for SSI power supply plugs. The power supply plugs are designed to fit these connectors in only one orientation. Find the proper orientation and push down firmly until the connectors completely fit.

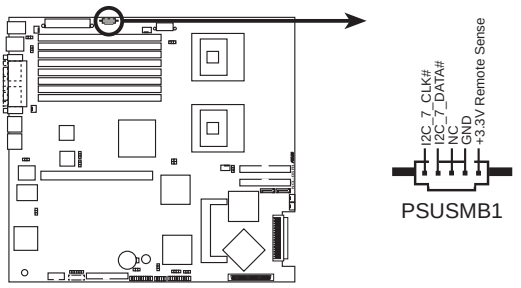
- Use of an SSI 12 V Specification 2.0-compliant power supply unit (PSU) that provides a minimum power of 450 W is recommended for a fully-configured system.
- Do not forget to connect the 8-pin ATX +12 V power plug; otherwise, the system will not boot up.
- Use of a PSU with a higher power output is recommended when configuring a system with more power consuming devices. The system may become unstable or may not boot up if the power is inadequate.
- You must install a PSU with a higher power rating if you intend to install additional devices.



NCL-DSR1 ATX Power connectors

9. Power supply SMBus connector (5-pin PSUSMB1)

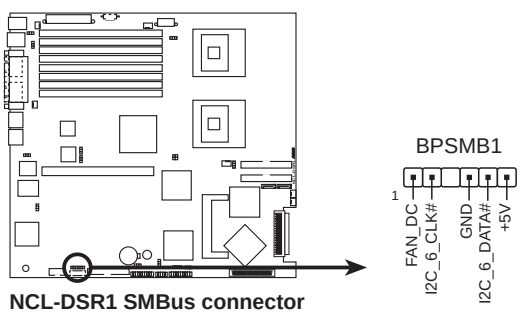
This connects SMBus (System Management Bus) devices to the power supply unit. Devices communicate with an SMBus host and/or other SMBus devices using the SMBus interface.



NCL-DSR1 Power supply SMBus connector

10. Backplane SMBus connector (6-1 pin BPSMB1)

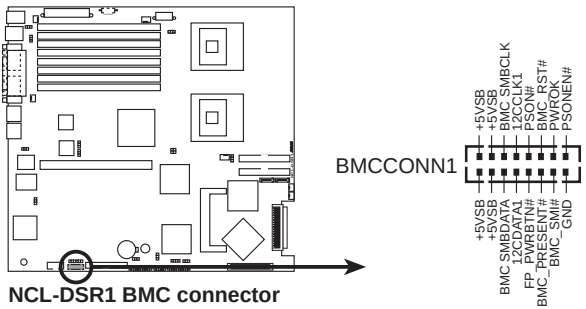
This connector allows you to connect SMBus (System Management Bus) devices. Devices communicate with an SMBus host and/or other SMBus devices using the SMBus interface.



NCL-DSR1 SMBus connector

11. BMC connector (16-pin BMCCONN1)

This connector is for the optional ASUS server management card.

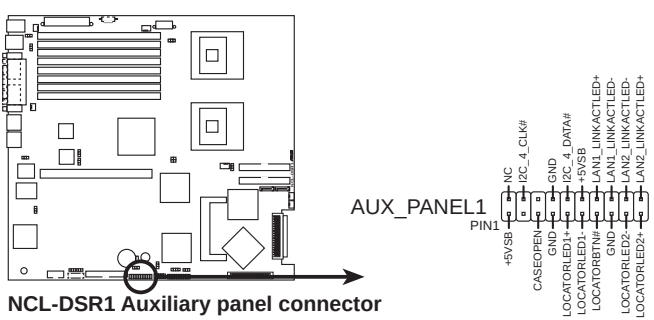


NCL-DSR1 BMC connector

12. Auxiliary panel connector (20-pin AUX_PANEL1)

This connector is for additional front panel features including front panel SMB, locator LED and switch, chassis intrusion, and LAN LEDs.

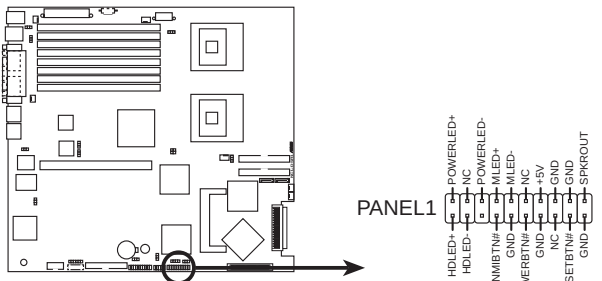
- **Front panel SMB (6-1 pin FPSMB)**
  These leads connect the front panel SMBus cable.
- **LAN activity LED (2-pin LAN1, LAN2)**
  These leads are for Gigabit LAN activity LEDs on the front panel.
- **Chassis intrusion (4-1 pin CHASSIS)**
  These leads are for the intrusion detection feature for chassis with intrusion sensor or microswitch. When you remove any chassis component, the sensor triggers and sends a high-level signal to these leads to record a chassis intrusion event.
- **Locator LED (6-pin LOCATOR)**
  These leads are for the locator switch and LED on the front panel.



NCL-DSR1 Auxiliary panel connector

13. System panel connector (20-pin PANEL1)

This connector supports several chassis-mounted functions.



NCL-DSR1 System panel connector

The sytem panel connector is color-coded for easy connection.

- **System power LED (Green 3-pin PLED)**
  This 3-pin connector is for the system power LED. Connect the chassis power LED cable to this connector. The system power LED lights up when you turn on the system power, and blinks when the system is in sleep mode.
- **Message LED (Brown 2-pin MLED)**
  This connector is for the message LED cable that connects to the front panel message LED. The message LED indicates the booting status. The LED blinks when the system is in the boot process until the operating system is loaded.
- **System warning speaker (Orange 4-pin SPEAKER)**
  This 4-pin connector is for the chassis-mounted system warning speaker. The speaker allows you to hear system beeps and warnings.
- **Hard disk drive activity LED (Red 2-pin HD_LED)**
  This 2-pin connector is for the HDD Activity LED. Connect the HDD Activity LED cable to this connector. The IDE LED lights up or flashes when data is read from or written to the HDD.
- **ATX power button/soft-off button (Yellow 2-pin PWRBTN)**
  This connector is for the system power button. Pressing the power button turns the system on or puts the system in sleep or soft-off mode depending on the BIOS settings. Pressing the power switch for more than four seconds while the system is ON turns the system OFF.
- **Reset button (Blue 2-pin RESET)**
  This 2-pin connector is for the chassis-mounted reset button for system reboot without turning off the system power.
- **Non-maskable interrupt (Light blue 2-pin NMI)**
  This 2-pin connector is for a front panel button to allow a non-maskable interrupt command to be sent to the operating system.

Chapter 5

This chapter lists the hardware setup procedures that you have to perform when installing or removing system components.

ASUS RS160-E2/CS3

BIOS setup

5.1 Managing and updating your BIOS

The following utilities allow you to manage and update the motherboard Basic Input/Output System (BIOS) setup.

1. **ASUS AFUDOS** (Updates the BIOS in DOS mode using a floppy disk.)
2. **ASUS CrashFree BIOS 2** (Updates the BIOS using a bootable floppy disk or the motherboard support CD when the BIOS file fails or gets corrupted.)
3. **ASUS Update** (Updates the BIOS in Windows® environment.)

Refer to the corresponding sections for details on these utilities.

Save a copy of the original motherboard BIOS file to a bootable floppy disk in case you need to restore the BIOS in the future. Copy the original motherboard BIOS using the ASUS Update or Award BIOS Flash utilities.

5.1.1 Creating a bootable floppy disk

1. Do either one of the following to create a bootable floppy disk.
   DOS environment
   a. Insert a 1.44MB floppy disk into the drive.
   b. At the DOS prompt, type **`format A:/S`** then press <Enter>.
   Windows® XP environment
   a. Insert a 1.44 MB floppy disk to the floppy disk drive.
   b. Click **Start** from the Windows® desktop, then select **My Computer**.
   c. Select the 3 1/2 Floppy Drive icon.
   d. Click **File** from the menu, then select **Format**. A **Format 3 1/2 Floppy Disk** window appears.
   e. **Windows® XP users:** Select **Create an MS-DOS startup disk** from the format options field, then click **Start**.

5.1.2 AFUDOS Utility

The AFUDOS utility allows you to update the BIOS file in DOS environment using a bootable floppy disk with the updated BIOS file. This utility also allows you to copy the current BIOS file that you can use as backup when the BIOS fails or gets corrupted during the updating process.

Copying the current BIOS

To copy the current BIOS file using the AFUDOS utility:

- Make sure that the floppy disk is not write-protected and has at least 600 KB free space to save the file.
- The succeeding BIOS screens are for reference only. The actual BIOS screen displays may not be same as shown.

1. Copy the AFUDOS utility (afudos.exe) from the motherboard support CD to the bootable floppy disk you created earlier.
2. Boot the system in DOS mode, then at the prompt type:

   afudos /o[filename]

   where the [filename] is any user-assigned filename not more than eight alphanumeric characters for the main filename and three alphanumeric characters for the extension name.

3. Press <Enter>. The utility copies the current BIOS file to the floppy disk.

```
A:\>afudos /oOLDBIOS1.rom
AMI Firmware Update Utility - Version 1.19(ASUS V2.07(03.11.24BB))
Copyright (C) 2002 American Megatrends, Inc. All rights reserved.
    Reading flash ..... done
    Write to file...... ok
A:\>
```

   The utility returns to the DOS prompt after copying the current BIOS file.

Updating the BIOS file

To update the BIOS file using the AFUDOS utility:

1. Visit the ASUS website (www.asus.com) and download the latest BIOS file for the motherboard. Save the BIOS file to a bootable floppy disk.

Write the BIOS filename on a piece of paper. You need to type the exact BIOS filename at the DOS prompt.

2. Copy the AFUDOS utility (afudos.exe) from the motherboard support CD to the bootable floppy disk you created earlier.
3. Boot the system in DOS mode, then at the prompt type:

   afudos /i[filename] /pbnc

   where [filename] is the latest or the original BIOS file on the bootable floppy disk.

```
A:\>afudos /iNCLDSR1.rom /pbnc
```

4. The utility verifies the file and starts updating the BIOS.

```
A:\>afudos /iNCLDSR1.ROM /pbnc
AMI Firmware Update Utility - Version 1.19 (ASUS V2.07(03.11.24BB))
Copyright (C) 2002 American Megatrends, Inc. All rights reserved.

    WARNING!! Do not turn off power during flash BIOS
    Reading file ....... done
    Reading flash ...... done

    Advance Check ......
    Erasing flash ...... done
    Writing flash ...... 0x0008CC00 (9%)
```

Do not shut down or reset the system while updating the BIOS to prevent system boot failure!

5. The utility returns to the DOS prompt after the BIOS update process is completed. Reboot the system from the hard disk drive.

```
A:\>afudos /iNCLDSR1.ROM /pbnc
AMI Firmware Update Utility - Version 1.19 (ASUS V2.07(03.11.24BB))
Copyright (C) 2002 American Megatrends, Inc. All rights reserved.

    WARNING!! Do not turn off power during flash BIOS
    Reading file ....... done
    Reading flash ...... done

    Advance Check ......
    Erasing flash ...... done
    Writing flash ...... done
    Verifying flash .... done

    Please restart your computer

A:\>
```

5.1.3 ASUS CrashFree BIOS 2 utility

The ASUS CrashFree BIOS 2 is an auto recovery tool that allows you to restore the BIOS file when it fails or gets corrupted during the updating process. You can update a corrupted BIOS file using the motherboard support CD or the floppy disk that contains the updated BIOS file.

- Prepare the motherboard support CD or the floppy disk containing the updated motherboard BIOS before using this utility.
- Make sure that you rename the original or updated BIOS file in the floppy disk to **NCLDSR1.ROM**.

Recovering the BIOS from a floppy disk

To recover the BIOS from a floppy disk:

1. Turn on the system.
2. Insert the floppy disk with the original or updated BIOS file to the floppy disk drive.
3. The utility displays the following message and automatically checks the floppy disk for the original or updated BIOS file.

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for floppy...
```

When found, the utility reads the BIOS file and starts flashing the corrupted BIOS file.

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for floppy...
Floppy found!
Reading file "NCLDSR1.ROM". Completed.
Start flashing...
```

DO NOT shut down or reset the system while updating the BIOS! Doing so can cause system boot failure!

4. Restart the system after the utility completes the updating process.

Recovering the BIOS from the support CD

To recover the BIOS from the support CD:

1. Remove any floppy disk from the floppy disk drive, then turn on the system.
2. Insert the support CD to the optical drive.
3. The utility displays the following message and automatically checks the floppy disk for the original or updated BIOS file.

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for floppy...
```

When no floppy disk is found, the utility automatically checks the optical drive for the original or updated BIOS file. The utility then updates the corrupted BIOS file.

```
Bad BIOS checksum. Starting BIOS recovery...
Checking for floppy...
Floppy not found!
Checking for CD-ROM...
CD-ROM found!
Reading file "NCLDSR1.ROM". Completed.
Start flashing...
```

DO NOT shut down or reset the system while updating the BIOS! Doing so can cause system boot failure!

4. Restart the system after the utility completes the updating process.

The recovered BIOS may not be the latest BIOS version for this motherboard. Visit the ASUS website (www.asus.com) to download the latest BIOS file.

5.1.4 ASUS Update utility

The ASUS Update is a utility that allows you to manage, save, and update the motherboard BIOS in Windows® environment. The ASUS Update utility allows you to:

- Save the current BIOS file
- Download the latest BIOS file from the Internet
- Update the BIOS from an updated BIOS file
- Update the BIOS directly from the Internet, and
- View the BIOS version information.

This utility is available in the support CD that comes with the motherboard package.

ASUS Update requires an Internet connection either through a network or an Internet Service Provider (ISP).

Installing ASUS Update

To install ASUS Update:

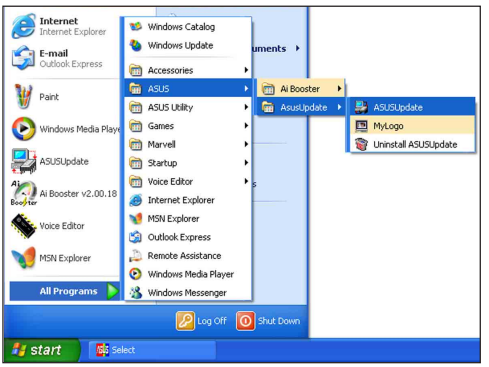
1. Place the support CD in the optical drive. The **Drivers** menu appears.
2. Click the **Utilities** tab, then click **Install ASUS Update VX.XX.XX**.
3. The ASUS Update utility is copied to your system.

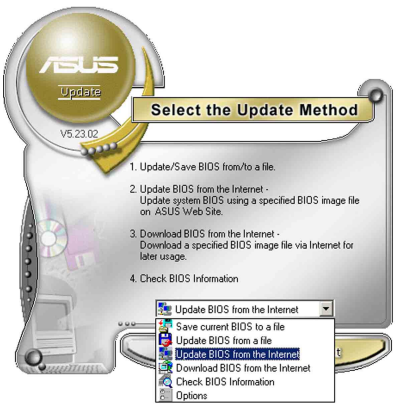
Quit all Windows® applications before you update the BIOS using this utility.

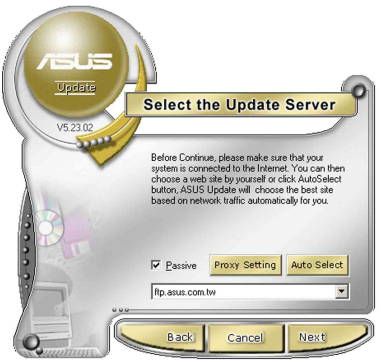
Updating the BIOS through the Internet

To update the BIOS through the Internet:

1. Launch the ASUS Update utility from the Windows® desktop by clicking **Start** > **Programs** > **ASUS** > **ASUSUpdate** > **ASUSUpdate**. The ASUS Update main window appears.



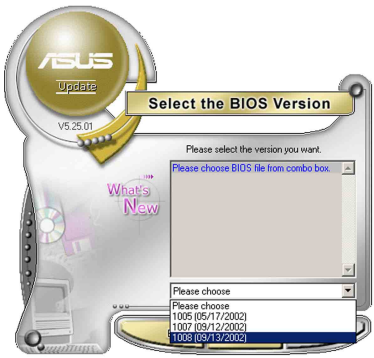

Update
V5.23.02
Select the Update Method
1. Update/Save BIOS from/to a file.
2. Update BIOS from the Internet -
Update system BIOS using a specified BIOS image file on ASUS Web Site.
3. Download BIOS from the Internet -
Download a specified BIOS image file via Internet for later usage.
4. Check BIOS Information
Update BIOS from the Internet
Save current BIOS to a file
Update BIOS from a file
Update BIOS from the Internet
Download BIOS from the Internet
Check BIOS Information
Options


Update
V5.23.02
Select the Update Server
Before Continue, please make sure that your system is connected to the Internet. You can then choose a web site by yourself or click AutoSelect button, ASUS Update will choose the best site based on network traffic automatically for you.
Passive
Proxy Setting
Auto Select
ftp.asus.com.tw
Back
Cancel
Next

2. Select **Update BIOS from the Internet** option from the drop-down menu, then click **Next**.

3. Select the ASUS FTP site nearest you to avoid network traffic, or click **Auto Select**. Click **Next**.

4. From the FTP site, select the BIOS version that you wish to download. Click Next.
5. Follow the screen instructions to complete the update process.

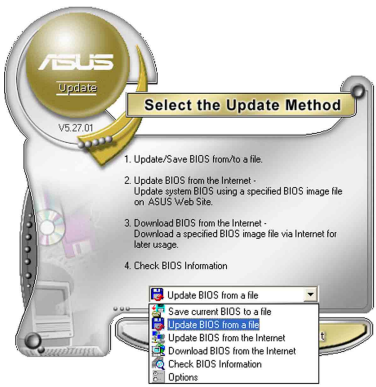


The ASUS Update utility is capable of updating itself through the Internet. Always update the utility to avail all its features.

Updating the BIOS through a BIOS file

To update the BIOS through a BIOS file:

1. Launch the ASUS Update utility from the Windows® desktop by clicking **Start** > **Programs** > **ASUS** > **ASUSUpdate** > **ASUSUpdate**. The ASUS Update main window appears.
2. Select **Update BIOS from a file** option from the drop-down menu, then click **Next**.


Update
V5.27.01
Select the Update Method
1. Update/Save BIOS from/to a file.
2. Update BIOS from the Internet - Update system BIOS using a specified BIOS image file on ASUS Web Site.
3. Download BIOS from the Internet - Download a specified BIOS image file via Internet for later usage.
4. Check BIOS Information
Update BIOS from a file
Save current BIOS to a file
Update BIOS from a file
Update BIOS from the Internet
Download BIOS from the Internet
Check BIOS Information
Options

3. Locate the BIOS file from the **Open** window, then click **Save**.
4. Follow the screen instructions to complete the update process.

5.2 BIOS setup program

This motherboard supports a programmable firmware chip that you can update using the provided utility described in section "5.1 Managing and updating your BIOS."

Use the BIOS Setup program when you are installing a motherboard, reconfiguring your system, or prompted to "Run Setup". This section explains how to configure your system using this utility.

Even if you are not prompted to use the Setup program, you can change the configuration of your computer in the future. For example, you can enable the security password feature or change the power management settings. This requires you to reconfigure your system using the BIOS Setup program so that the computer can recognize these changes and record them in the CMOS RAM of the firmware hub.

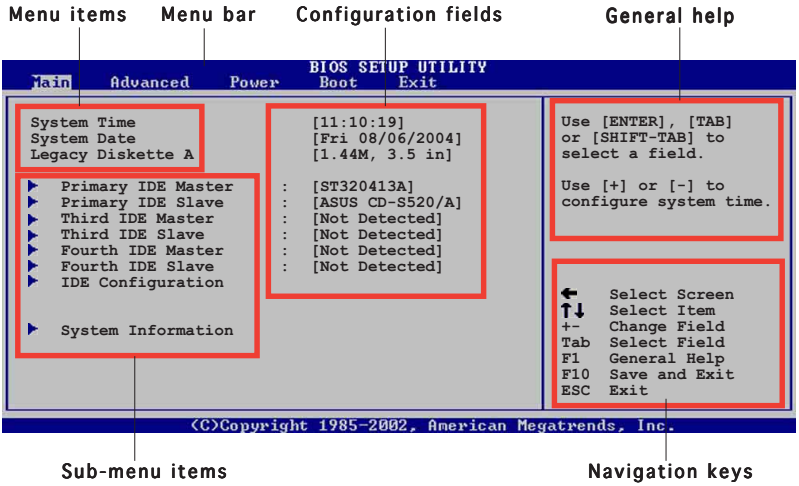
The firmware hub on the motherboard stores the Setup utility. When you start up the computer, the system provides you with the opportunity to run this program. Press <Del> during the Power-On-Self-Test (POST) to enter the Setup utility; otherwise, POST continues with its test routines.

If you wish to enter Setup after POST, restart the system by pressing <Ctrl+Alt+Delete>, or by pressing the reset button on the system chassis. You can also restart by turning the system off and then back on. Do this last option only if the first two failed.

The Setup program is designed to make it as easy to use as possible. Being a menu-driven program, it lets you scroll through the various sub-menus and make your selections from the available options using the navigation keys.

- The default BIOS settings for this motherboard apply for most conditions to ensure optimum performance. If the system becomes unstable after changing any BIOS settings, load the default settings to ensure system compatibility and stability. Select the **Load Setup Defaults** item under the Exit Menu. See section "5.7 Exit Menu."
- The BIOS setup screens shown in this section are for reference purposes only, and may not exactly match what you see on your screen.
- Visit the ASUS website (www.asus.com) to download the latest BIOS file for this motherboard.

5.2.1 BIOS menu screen



5.2.2 Menu bar

The menu bar on top of the screen has the following main items:

Main	For changing the basic system configuration
Advanced	For changing the advanced system settings
Power	For changing the advanced power management (APM) configuration
Boot	For changing the system boot configuration
Exit	For selecting the exit options and loading default settings

To select an item on the menu bar, press the right or left arrow key on the keyboard until the desired item is highlighted.

5.2.3 Navigation keys

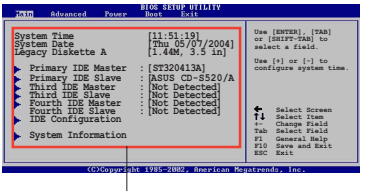
At the bottom right corner of a menu screen are the navigation keys for that particular menu. Use the navigation keys to select items in the menu and change the settings.

Some of the navigation keys differ from one screen to another.

5.2.4 Menu items

The highlighted item on the menu bar displays the specific items for that menu. For example, selecting **Main** shows the Main menu items.

The other items (Advanced, Power, Boot, and Exit) on the menu bar have their respective menu items.


BIOS SETUP UTILITY
Main Advanced Power Boot Exit
System Time [11:51:19]
System Date [Thu 05/07/2004]
Legacy Diskette A [1.44M, 3.5 in]
Primary IDE Master : [ST320413A]
Primary IDE Slave : [ASUS CD-S520/A]
Third IDE Master : [Not Detected]
Third IDE Slave : [Not Detected]
Fourth IDE Master : [Not Detected]
Fourth IDE Slave : [Not Detected]
IDE Configuration
System Information
Use [ENTER], [TAB] or [SHIFT-TAB] to select a field.
Use [+] or [-] to configure system time.
Select Screen
Select Item
Change Field
Tab Select Field
F1 General Help
F10 Save and Exit
ESC Exit
(C)Copyright 1985-2002, American Megatrends, Inc.

Main menu items

5.2.5 Sub-menu items

A solid triangle before each item on any menu screen means that the iteam has a sub-menu. To display the sub-menu, select the item and press <Enter>.

5.2.6 Configuration fields

These fields show the values for the menu items. If an item is user-configurable, you can change the value of the field opposite the item. You cannot select an item that is not user-configurable.

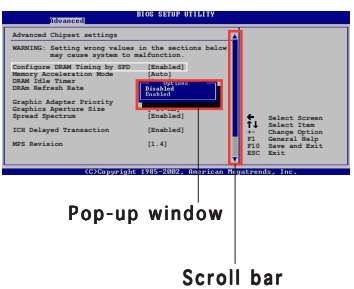
A configurable field is enclosed in brackets, and is highlighted when selected. To change the value of a field, select it then press <Enter> to display a list of options. Refer to "5.2.7 Pop-up window."

5.2.7 Pop-up window

Select a menu item then press <Enter> to display a pop-up window with the configuration options for that item.

5.2.8 Scroll bar

A scroll bar appears on the right side of a menu screen when there are items that do not fit on the screen. Press the Up/Down arrow keys or <Page Up> / <Page Down> keys to display the other items on the screen.



Pop-up window

Scroll bar

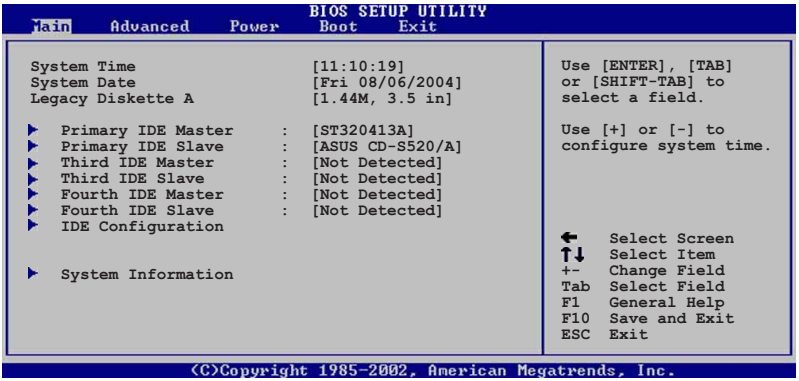
5.2.9 General help

At the top right corner of the menu screen is a brief description of the selected item.

5.3 Main menu

When you enter the BIOS Setup program, the **Main** menu screen appears, giving you an overview of the basic system information.

Refer to section "5.2.1 BIOS menu screen" for information on the menu screen items and how to navigate through them.


BIOS SETUP UTILITY
Main Advanced Power Boot Exit
System Time [11:10:19]
System Date [Fri 08/06/2004]
Legacy Diskette A [1.44M, 3.5 in]
Primary IDE Master : [ST320413A]
Primary IDE Slave : [ASUS CD-S520/A]
Third IDE Master : [Not Detected]
Third IDE Slave : [Not Detected]
Fourth IDE Master : [Not Detected]
Fourth IDE Slave : [Not Detected]
IDE Configuration
System Information
Use [ENTER], [TAB] or [SHIFT-TAB] to select a field.
Use [+] or [-] to configure system time.
Select Screen
Select Item
+- Change Field
Tab Select Field
F1 General Help
F10 Save and Exit
ESC Exit
(C)Copyright 1985-2002, American Megatrends, Inc.

5.3.1 System Time [xx:xx:xxxx]

Allows you to set the system time.

5.3.2 System Date [Day xx/xx/xxxx]

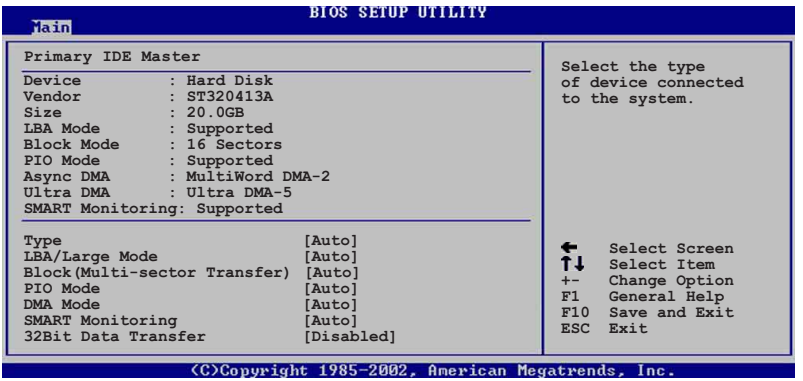
Allows you to set the system date.

5.3.3 Legacy Diskette A [1.44M, 3.5 in.]

Sets the type of floppy drive installed. Configuration options: [Disabled] [360K, 5.25 in.] [1.2M , 5.25 in.] [720K , 3.5 in.] [1.44M, 3.5 in.] [2.88M, 3.5 in.]

5.3.4 Primary, Third and Fourth IDE Master/Slave

The BIOS automatically detects the connected IDE devices. There is a separate sub-menu for each IDE device. Select a device item, then press <Enter> to display the IDE device information.



The BIOS automatically detects the values opposite the dimmed items (Device, Vendor, Size, LBA Mode, Block Mode, PIO Mode, Async DMA, Ultra DMA, and SMART monitoring). These values are not user-configurable. These items show N/A if no IDE device is installed in the system.

Type [Auto]

Selects the type of IDE drive. Setting to [Auto] allows automatic selection of the appropriate IDE device type. Select [CDROM] if you are specifically configuring a CD-ROM drive. Select [ARMD] (ATAPI Removable Media Device) if your device is either a ZIP, LS-120, or MO drive.
Configuration options: [Not Installed] [Auto] [CDROM] [ARMD]

LBA/Large Mode [Auto]

Enables or disables the LBA mode. Setting to [Auto] enables the LBA mode if the device supports this mode, and if the device was not previously formatted with LBA mode disabled. Configuration options: [Disabled] [Auto]

Block (Multi-sector Transfer) [Auto]

Enables or disables data multi-sectors transfers. When set to [Auto], the data transfer from and to the device occurs multiple sectors at a time if the device supports multi-sector transfer feature. When set to [Disabled], the data transfer from and to the device occurs one sector at a time.
Configuration options: [Disabled] [Auto]

PIO Mode [Auto]

Selects the PIO mode.
Configuration options: [Auto] [0] [1] [2] [3] [4]

DMA Mode [Auto]

Selects the DMA mode. Configuration options: [Auto]

SMART Monitoring [Auto]

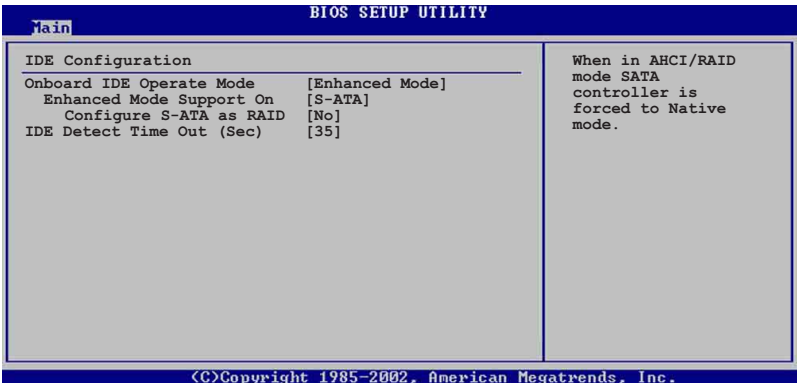
Sets the Smart Monitoring, Analysis, and Reporting Technology.
Configuration options: [Auto] [Disabled] [Enabled]

32Bit Data Transfer [Disabled]

Enables or disables 32-bit data transfer.
Configuration options: [Disabled] [Enabled]

5.3.5 IDE Configuration

The items in this menu allow you to set or change the configurations for the IDE devices installed in the system. Select an item then press <Enter> if you wish to configure the item.


BIOS SETUP UTILITY
Main
IDE Configuration
Onboard IDE Operate Mode [Enhanced Mode]
Enhanced Mode Support On [S-ATA]
Configure S-ATA as RAID [No]
IDE Detect Time Out (Sec) [35]
When in AHCI/RAID mode SATA controller is forced to Native mode.
(C)Copyright 1985-2002, American Megatrends, Inc.

Onboard IDE Operate Mode [Enhanced Mode]

Allows selection of the IDE operation mode depending on the installed operating system (OS). Set to [Enhanced Mode] if you are using native OS, e.g. Windows® 2000/XP. Set to [Compatible Mode] if you are using legacy OS, e.g. Windows ME/98/NT, MS-DOS.
Configuration options: [Compatible Mode] [Enhanced Mode]

The items **Enhanced Mode Support On** and **Configure S-ATA as RAID** appear only when you set the Onboard IDE Operate Mode to [Enhanced Mode].

Enhanced Mode Support On [S-ATA]

Allows you to set Serial ATA, Parallel ATA, or both, to native mode.
Configuration options: [P-ATA+S-ATA] [S-ATA] [P-ATA]

Configure S-ATA as RAID [No]

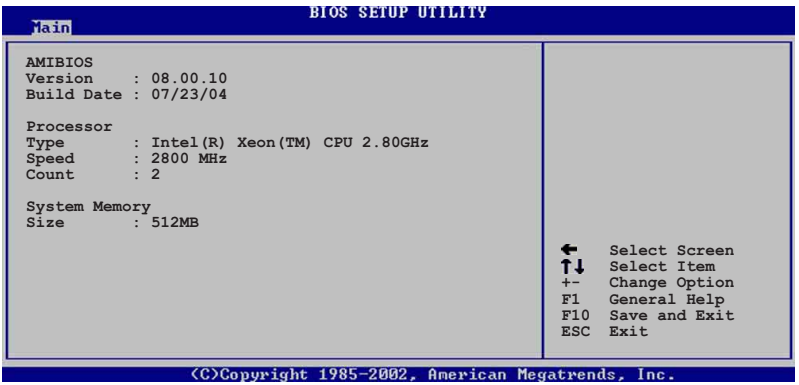
Allows you to configure the Serial ATA devices as RAID sets.
Configuration options: [No] [Yes]

IDE Detect Time Out (Sec) [35]

Selects the time our value (in seconds) for detecting ATA/ATAPI devices.
Configuration options: [0] [5] [10] [15] [20] [25] [30] [35]

5.3.6 System Information

This menu gives you an overview of the general system specifications. The BIOS automatically detects the items in this menu.



AMI BIOS

Displays the auto-detected BIOS information

Processor

Displays the auto-detected CPU specification

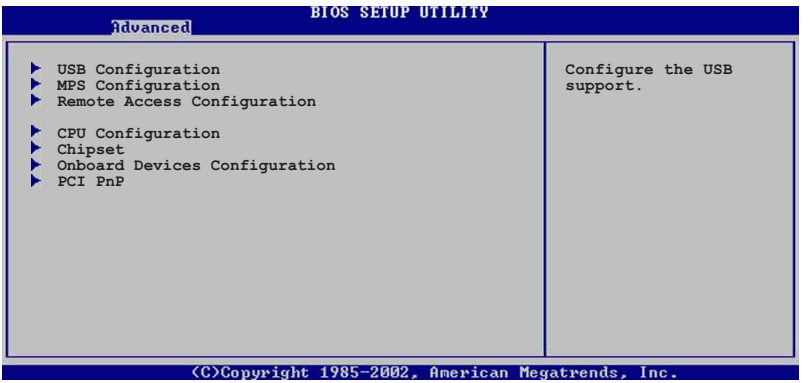
System Memory

Displays the auto-detected system memory

5.4 Advanced menu

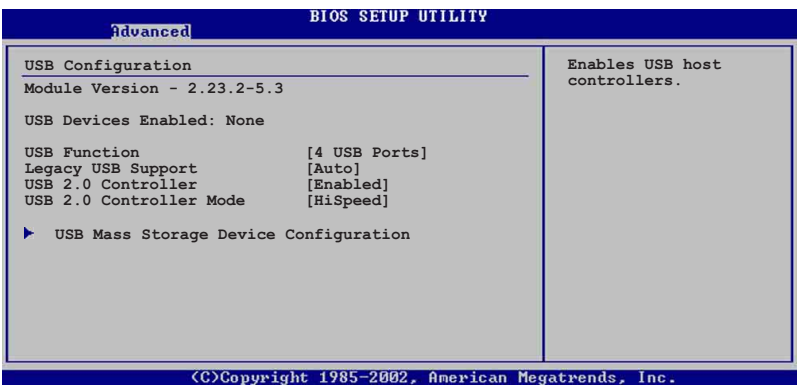
The Advanced menu items allow you to change the settings for the CPU and other system devices.

Take caution when changing the settings of the Advanced menu items. Incorrect field values can cause the system to malfunction.



5.4.1 USB Configuration

The items in this menu allows you to change the USB-related features. Select an item then press <Enter> to display the configuration options.



The **Module Version** and **USB Devices Enabled** items show the auto-detected values. If no USB device is detected, the **USB Devices Enabled** item shows **None**.

USB Function [4 USB Ports]

Allows you to enable a specific number of USB ports, or disable the USB function. Configuration options: [Disabled] [2 USB Ports] [4 USB Ports]

Legacy USB Support [Auto]

Allows you to enable or disable support for legacy USB devices. Setting to [Auto] allows the system to detect the presence of legacy USB devices at startup. If detected, the USB controller legacy mode is enabled. If no legacy USB device is detected, the legacy USB support is disabled.
Configuration options: [Disabled] [Enabled] [Auto]

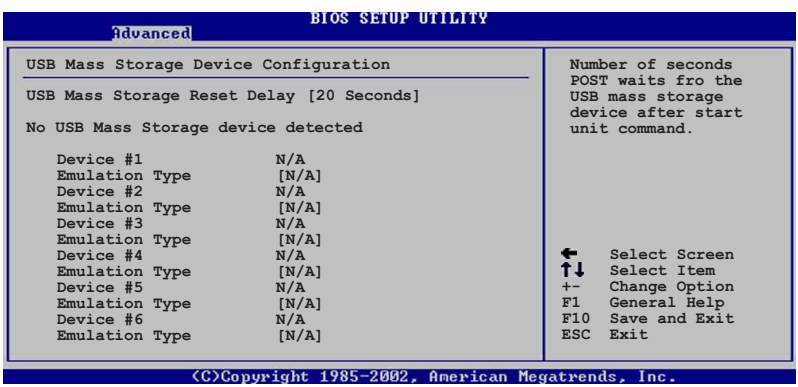
USB 2.0 Controller [Enabled]

Allows you to enable or disable the USB 2.0 controller.
Configuration options: [Enabled] [Disabled]

USB 2.0 Controller Mode [HiSpeed]

Allows you to set the USB 2.0 controller mode to HiSpeed (480 Mbps) or FullSpeed (12 Mbps). Configuration options: [FullSpeed] [HiSpeed]

USB Mass Storage Device Configuration



USB Mass Storage Reset Delay [20 Sec]

Allows you to select the number of seconds POST waits for the USB mass storage device after the start unit command. The message “No USB mass storage device detected” appears if none is installed in the system. Configuration options: [10 Sec] [20 Sec] [30 Sec] [40 Sec]

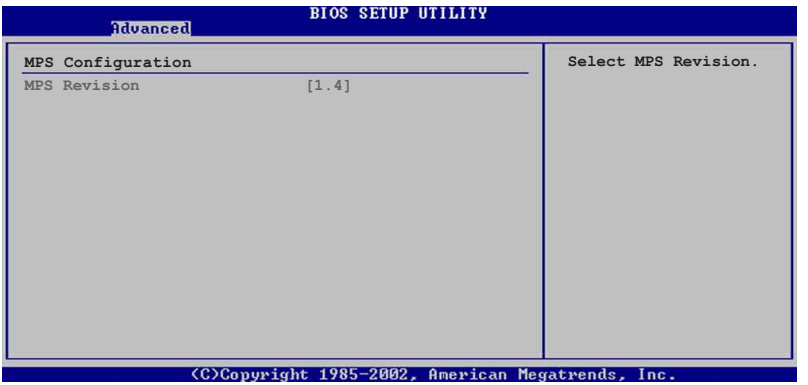
Emulation Type [N/A]

When set to Auto, USB devices less than 530MB will be emulated as floppy drive, and the remaining drives as hard drives. Forced FDD option can be used to force an HDD formatted drive to boot as FDD (for example, ZIP drive).

The Device and Emulation Type items appear only when there are installed USB devices.

5.4.2 MPS Configuration

The items in this menu allows you to configure the Multi-Processor Table. Select an item then press <Enter> to display the configuration options.

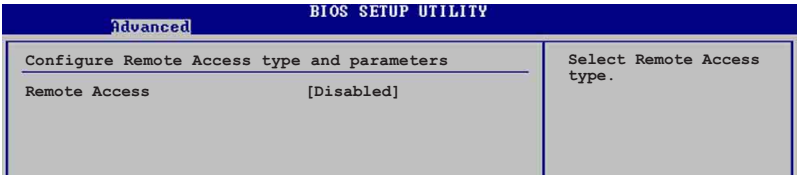


MPS Revision [1.4]

Allows you to select the multi-processor system version.
Configuration options: [1.1] [1.4]

5.4.3 Remote Access Configuration

The items in this menu allows you to configure the Remote Access features. Select an item then press <Enter> to display the configuration options.

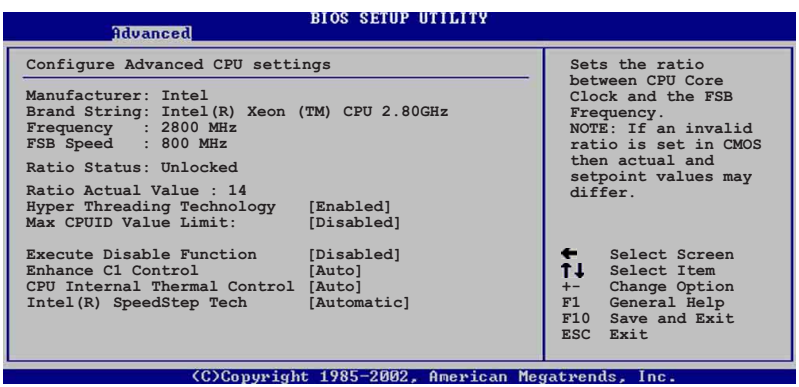


Remote Access [Disabled]

Enables or disables the remote access feature.
Configuration options: [Disabled] [Enabled]

5.4.4 CPU Configuration

The items in this menu show the CPU-related information that the BIOS automatically detects.


BIOS SETUP UTILITY
Advanced
Configure Advanced CPU settings
Manufacturer: Intel
Brand String: Intel(R) Xeon (TM) CPU 2.80GHz
Frequency : 2800 MHz
FSB Speed : 800 MHz
Ratio Status: Unlocked
Ratio Actual Value : 14
Hyper Threading Technology [Enabled]
Max CPUID Value Limit: [Disabled]
Execute Disable Function [Disabled]
Enhance C1 Control [Auto]
CPU Internal Thermal Control [Auto]
Intel(R) SpeedStep Tech [Automatic]
Sets the ratio between CPU Core Clock and the FSB Frequency.
NOTE: If an invalid ratio is set in CMOS then actual and setpoint values may differ.
Select Screen
Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
(C)Copyright 1985-2002, American Megatrends, Inc.

Hyper-Threading Technology [Enabled]

Allows you to enable or disable the processor Hyper-Threading Technology.
Configuration options: [Disabled] [Enabled]

Max CPUID Value Limit [Disabled]

Setting this item to [Enabled] allows legacy operating systems to boot even without support for CPUs with extended CPUID functions.
Configuration options: [Disabled] [Enabled]

Execute Disable Function [Disabled]

Configuration options: [Disabled] [Enabled]

Enhance C1 Control [Auto]

Configuration options: [Auto] [Disabled]

CPU Internal Thermal Control [Auto]

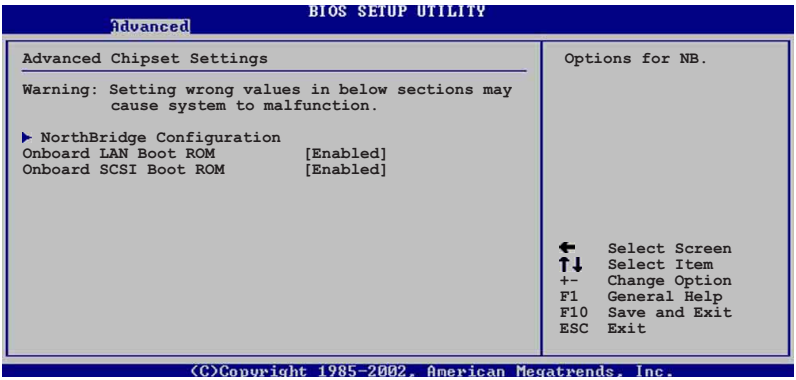
Configuration options: [Auto] [Disabled]

Intel(R) SpeedStep Tech [Automatic]

Configuration options: [Automatic] [Maximum Speed] [Minimum Speed] [Disabled]

5.4.5 Chipset

The Chipset menu allows you to change the advanced chipset settings. Select an item then press <Enter> to display the sub-menu.



Onboard LAN Boot ROM [Enabled]

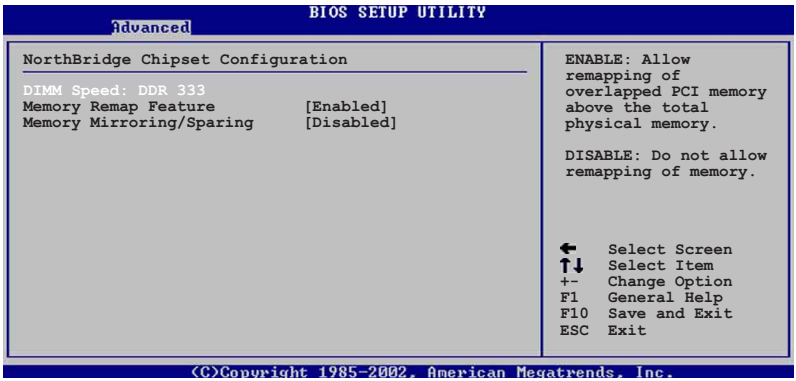
Allows you to enable or disable the option ROM in the onboard LAN controller. Configuration options: [Disabled] [Enabled]

Onboard SCSI Boot ROM [Enabled]

Allows you to enable or disable the option ROM in the onboard SCSI controller. Configuration options: [Disabled] [Enabled]

NorthBridge Configuration

The NorthBridge Configuration menu allows you to change the Northbridge settings.



DIMM Speed

Displays the installed DIMM type and speed. This item is auto-detected and is not configurable.

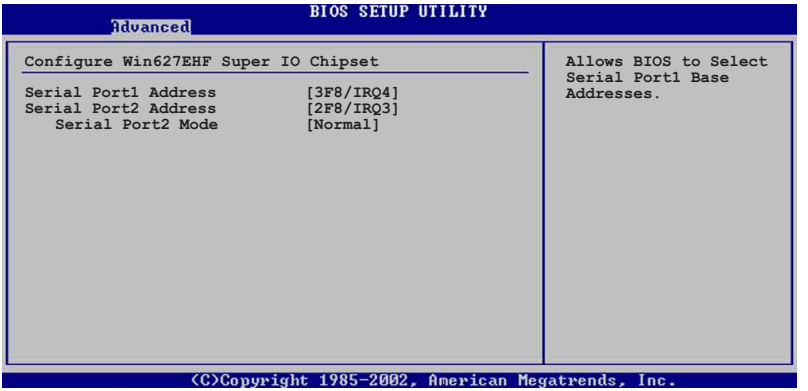
Memory Remap Feature [Enabled]

Allows you to remap the overlap PCI memory over the total physical memory. Configuration options: [Disabled] [Enabled]

Memory Mirroring/Sparing [Disabled]

Configuration options: [Disabled] [Mirroring] [Sparing]

5.4.6 Onboard Devices Configuration


BIOS SETUP UTILITY
Advanced
Configure Win627EHF Super IO Chipset
Serial Port1 Address [3F8/IRQ4]
Serial Port2 Address [2F8/IRQ3]
Serial Port2 Mode [Normal]
Allows BIOS to Select Serial Port1 Base Addresses.
(C)Copyright 1985-2002, American Megatrends, Inc.

Serial Port1 Address [3F8/IRQ4]

Allows you to select the Serial Port1 base address.
Configuration options: [Disabled] [3F8/IRQ4] [3E8/IRQ4] [2E8/IRQ3]

Serial Port2 Address [2F8/IRQ3]

Allows you to select the Serial Port2 base address.
Configuration options: [Disabled] [2F8/IRQ3] [3E8/IRQ4] [2E8/IRQ3]

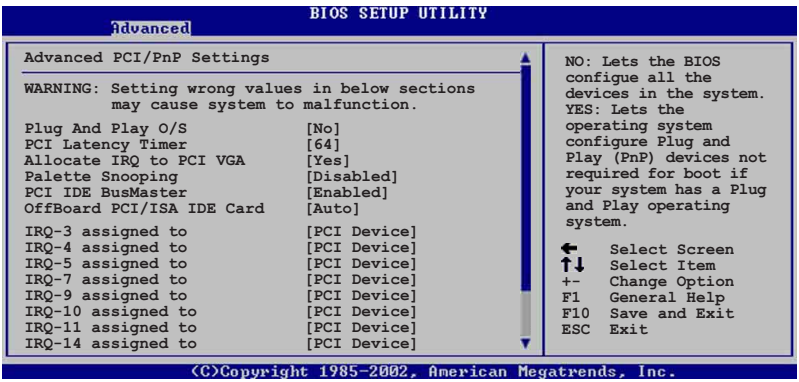
Serial Port2 Mode [Normal]

Allows you to set the BIOS selection mode for Serial Port2.
Configuration options: [Normal] [IrDA] [ASK IR]

5.4.7 PCI PnP

The PCI PnP menu items allow you to change the advanced settings for PCI/PnP devices. The menu includes setting the IRQ and DMA channel resources for either PCI/PnP or legacy ISA devices, and setting the memory size block for legacy ISA devices.

Take caution when changing the settings of the PCI PnP menu items. Incorrect field values can cause the system to malfunction!


BIOS SETUP UTILITY
Advanced
Advanced PCI/PnP Settings
WARNING: Setting wrong values in below sections may cause system to malfunction.
Plug And Play O/S [No]
PCI Latency Timer [64]
Allocate IRQ to PCI VGA [Yes]
Palette Snooping [Disabled]
PCI IDE BusMaster [Enabled]
OffBoard PCI/ISA IDE Card [Auto]
IRQ-3 assigned to [PCI Device]
IRQ-4 assigned to [PCI Device]
IRQ-5 assigned to [PCI Device]
IRQ-7 assigned to [PCI Device]
IRQ-9 assigned to [PCI Device]
IRQ-10 assigned to [PCI Device]
IRQ-11 assigned to [PCI Device]
IRQ-14 assigned to [PCI Device]
NO: Lets the BIOS configue all the devices in the system. YES: Lets the operating system configure Plug and Play (PnP) devices not required for boot if your system has a Plug and Play operating system.
Select Screen
Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
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Plug And Play O/S [No]

When set to [No], BIOS configures all the devices in the system. When set to [Yes] and if you install a Plug and Play operating system, the operating system configures the Plug and Play devices not required for boot. Configuration options: [No] [Yes]

PCI Latency Timer [64]

Allows you to select the value in units of PCI clocks for the PCI device latency timer register. Configuration options: [32] [64] [96] [128] [160] [192] [224] [248]

Allocate IRQ to PCI VGA [Yes]

When set to [Yes], BIOS assigns an IRQ to PCI VGA card if the card requests for an IRQ. When set to [No], BIOS does not assign an IRQ to the PCI VGA card even if requested. Configuration options: [Yes] [No]

Palette Snooping [Disabled]

When set to [Enabled], the pallete snooping feature informs the PCI devices that an ISA graphics device is installed in the system so that the latter can function correctly. Configuration options: [Disabled] [Enabled]

PCI IDE BusMaster [Enabled]

Allows BIOS to use PCI bus mastering when reading/writing to IDE devices.
Configuration options: [Disabled] [Enabled]

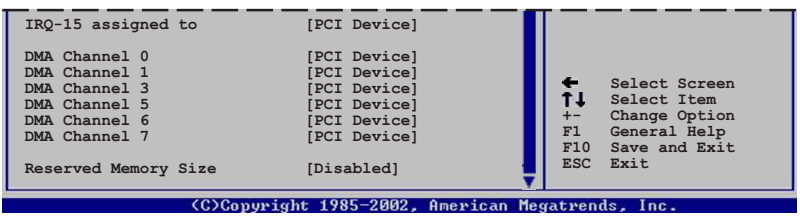
Offboard PCI/ISA IDE Card [Auto]

Allows you to assign a PCI slot to a PCI IDE card, when required.
Configuration options: [Auto] [PCI Slot1] [PCI Slot2] [PCI Slot3] [PCI Slot4] [PCI Slot5] [PCI Slot6]

IRQ-xx assigned to [PCI Device]

When set to [PCI Device], the specific IRQ is free for use of PCI/PnP devices. When set to [Reserved], the IRQ is reserved for legacy ISA devices. Configuration options: [PCI Device] [Reserved]

Use the arrow down key to scroll down the menu.


IRQ-15 assigned to [PCI Device]
DMA Channel 0 [PCI Device]
DMA Channel 1 [PCI Device]
DMA Channel 3 [PCI Device]
DMA Channel 5 [PCI Device]
DMA Channel 6 [PCI Device]
DMA Channel 7 [PCI Device]
Reserved Memory Size [Disabled]
Select Screen
Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
(C)Copyright 1985-2002, American Megatrends, Inc.

DMA Channel X assigned to [PCI Device]

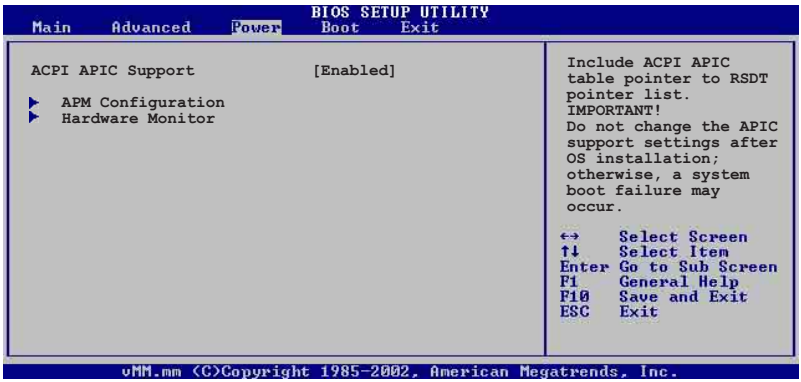
When set to [PCI Device], the specific DMA channel is free for use of PCI/PnP devices. When set to [Reserved], the DMA channel is reserved for legacy ISA devices. Configuration options: [PCI Device] [Reserved]

Reserved Memory Size [Disabled]

Allows you to set the reserved memory size.
Configuration options: [Disabled] [16k] [32k] [64k]

5.5 Power menu

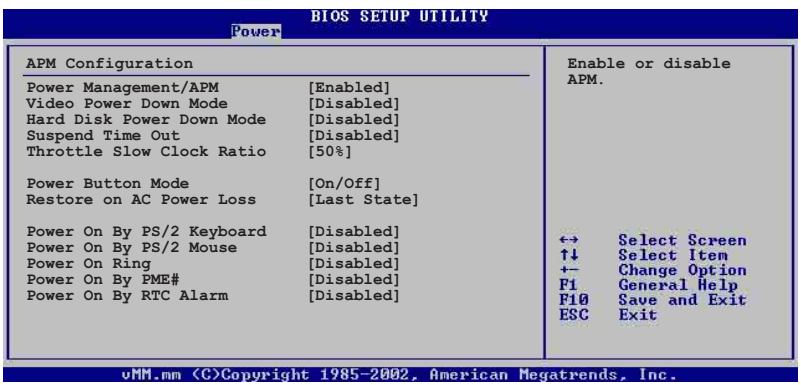
The Power menu items allow you to change the settings for the ACPI and Advanced Power Management (APM) features. Select an item then press <Enter> to display the configuration options.


BIOS SETUP UTILITY
Main Advanced Power Boot Exit
ACPI APIC Support [Enabled]
APM Configuration
Hardware Monitor
Include ACPI APIC table pointer to RSDT pointer list.
IMPORTANT!
Do not change the APIC support settings after OS installation; otherwise, a system boot failure may occur.
↔ Select Screen
↑↓ Select Item
Enter Go to Sub Screen
F1 General Help
F10 Save and Exit
ESC Exit
vMM.mm (C)Copyright 1985-2002, American Megatrends, Inc.

5.5.1 ACPI APIC Support [Enabled]

Allows you to enable or disable the Advanced Configuration and Power Interface (ACPI) support in the Application-Specific Integrated Circuit (ASIC). When set to Enabled, the ACPI APIC table pointer is included in the RSDT pointer list. Configuration options: [Disabled] [Enabled]

5.5.2 APM Configuration


BIOS SETUP UTILITY
Power
APM Configuration
Power Management/APM [Enabled]
Video Power Down Mode [Disabled]
Hard Disk Power Down Mode [Disabled]
Suspend Time Out [Disabled]
Throttle Slow Clock Ratio [50%]
Power Button Mode [On/Off]
Restore on AC Power Loss [Last State]
Power On By PS/2 Keyboard [Disabled]
Power On By PS/2 Mouse [Disabled]
Power On Ring [Disabled]
Power On By PME# [Disabled]
Power On By RTC Alarm [Disabled]
Enable or disable APM.
↔ Select Screen
↑↓ Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
vMM.mm (C)Copyright 1985-2002, American Megatrends, Inc.

Power Management [Enabled]

Allows you to enable or disable the motherboard Advance Power Management (APM) feature. Configuration options: [Enabled] [Disabled]

Video Power Down Mode [Suspend]

Allows you to select the video power down mode
Configuration options: [Disabled] [Standby] [Suspend]

Hard Disk Power Down Mode [Suspend]

Allows you to select the hard disk power down mode
Configuration options: [Disabled] [Standby] [Suspend]

Suspend Time Out [Disabled]

Allows you to select the specified time at which the system goes on suspend mode. Configuration options: [Disabled] [1 Min] [2 Min] [4 Min] [8 Min] [10 Min] [20 Min] [30 Min] [40 Min] [50 Min] [60 Min]

Throttle Slow Clock Ratio [50%]

Allows you to select duty cycle in throttle mode.
Configuration options: [87.5%] [75.0%] [62.5%] [50.0%] [37.5%] [25.0%] [12.5%]

Power Button Mode [On/Off]

Allows the system to go into On/Off mode or suspend mode when the power button is pressed. Configuration options: [On/Off] [Suspend]

Restore on AC Power Loss [Power Off]

When set to Power Off, the system goes into off state after an AC power loss. When set to Power On, the system goes on after an AC power loss. When set to Last State, the system goes into either off or on state, whatever the system state was before the AC power loss.
Configuration options: [Power Off] [Power On] [Last State]

Power On By PS/2 Keyboard [Disabled]

Allows you to use specific keys on the keyboard to turn on the system. This feature requires an ATX power supply that provides at least 1A on the +5VSB lead. Configuration options: [Disabled] [Enabled]

Power On By PS/2 Mouse [Disabled]

When set to [Enabled], this parameter allows you to use the PS/2 mouse to turn on the system. This feature requires an ATX power supply that provides at least 1A on the +5VSB lead. Configuration options: [Disabled] [Enabled]

Power On Ring [Disabled]

When set to [Enabled], the system enables the RI to generate a wake event while the computer is in Soft-off mode.
Configuration options: [Disabled] [Enabled]

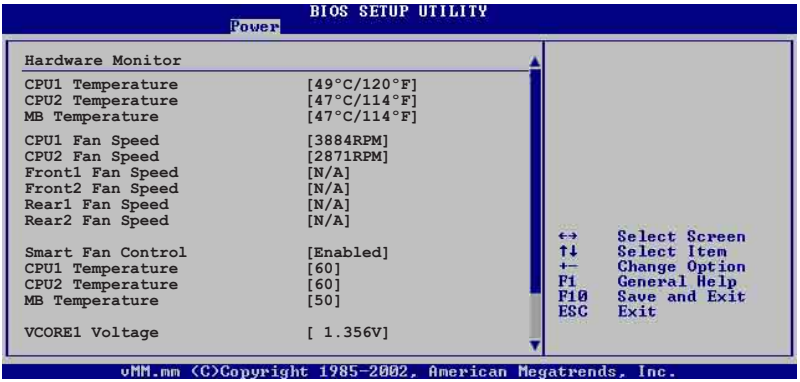
Power On By PME# [Disabled]

When set to [Enabled], the system enables the PME to generate a wake event while the computer is in Soft-off mode.
Configuration options: [Disabled] [Enabled]

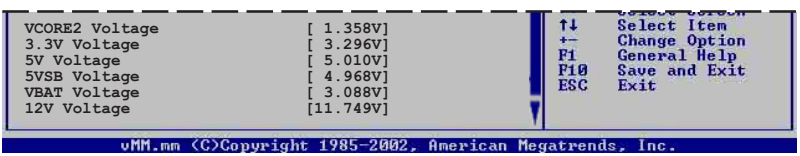
Power On By RTC Alarm [Disabled]

Allows you to enable or disable RTC to generate a wake event. When this item is set to [Enabled], the items RTC Alarm Date, RTC Alarm Hour, RTC Alarm Minute, and RTC Alarm Second appear with set values.
Configuration options: [Disabled] [Enabled]

5.5.3 Hardware Monitor



Use the arrow down key to display additional items.



CPU1/CPU2 Temperature [xxx°C/xxx°F]
MB Temperature [xxx°C/xxx°F]

The onboard hardware monitor automatically detects and displays the motherboard and CPU temperatures. Select [Disabled] if you do not wish to display the detected temperatures.

CPU1/CPU2 Fan Speed [xxxxRPM] or [N/A]
Front1/Front2 Fan Speed [xxxxRPM] or [N/A]
Rear1/Rear2 Fan Speed [xxxxRPM] or [N/A]

The onboard hardware monitor automatically detects and displays the CPU, front, and rear fan speeds in rotations per minute (RPM). If a fan is not connected to the connector on the motherboard, the field shows N/A.

Smart Fan Control [Enabled]

Allows you to enable or disable the ASUS Q-Fan feature that smartly adjusts the fan speeds for more efficient system operation. Configuration options: [Disabled] [Enabled]

The **CPU1 Temperature**, **CPU2 Temperature**, and **Front1 Temperature** items do not appear when you disable the **Smart Fan Control** feature.

CPU1/CPU2 Temperature [XXX]
MB Temperature [XXX]

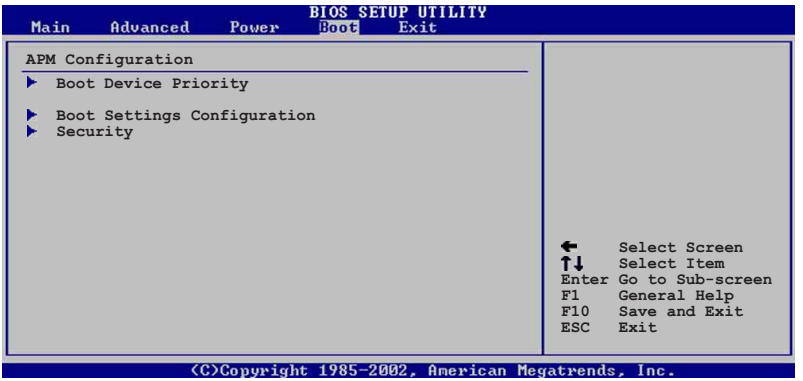
Displays the detected CPU and system threshold temperatures when the Smart Fan Control feature is enabled.

VCORE1 Voltage, VCORE2 Voltage, 3.3V Voltage, 5V Voltage, 5VSB Voltage, VBAT Voltage, 12V Voltage

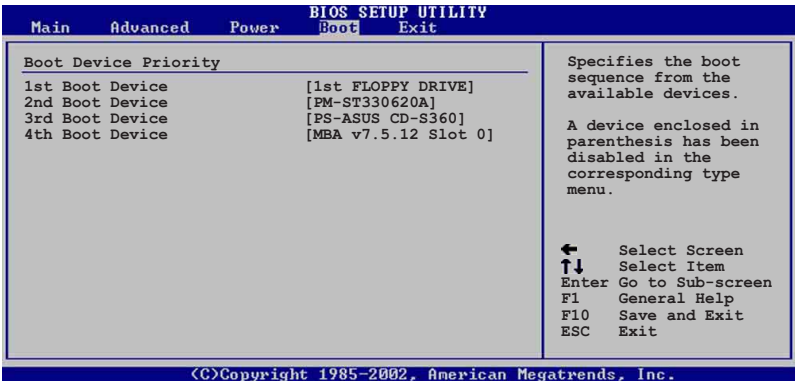
The onboard hardware monitor automatically detects the voltage outputs through the onboard voltage regulators.

5.6 Boot menu

The Boot menu items allow you to change the system boot options. Select an item then press <Enter> to display the sub-menu.



5.6.1 Boot Device Priority


BIOS SETUP UTILITY
Main Advanced Power Boot Exit
Boot Device Priority
1st Boot Device [1st FLOPPY DRIVE]
2nd Boot Device [PM-ST330620A]
3rd Boot Device [PS-ASUS CD-S360]
4th Boot Device [MBA v7.5.12 Slot 0]
Specifies the boot sequence from the available devices.
A device enclosed in parenthesis has been disabled in the corresponding type menu.
Select Screen
Select Item
Enter Go to Sub-screen
F1 General Help
F10 Save and Exit
ESC Exit
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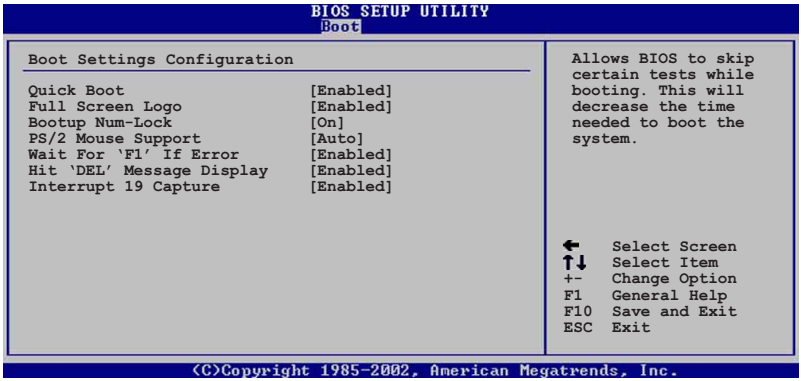
1st ~ xxth Boot Device [1st Floppy Drive]

These items specify the boot device priority sequence from the available devices. The number of device items that appears on the screen depends on the number of devices installed in the system.
Configuration options: [xxxxx Drive] [Disabled]

5.6.2 Boot Settings Configuration


BIOS SETUP UTILITY
Boot
Boot Settings Configuration
Quick Boot [Enabled]
Full Screen Logo [Enabled]
Bootup Num-Lock [On]
PS/2 Mouse Support [Auto]
Wait For 'F1' If Error [Enabled]
Hit 'DEL' Message Display [Enabled]
Interrupt 19 Capture [Enabled]
Allows BIOS to skip certain tests while booting. This will decrease the time needed to boot the system.
Select Screen
Select Item
+- Change Option
F1 General Help
F10 Save and Exit
ESC Exit
(C)Copyright 1985-2002, American Megatrends, Inc.

Quick Boot [Enabled]

Enabling this item allows the BIOS to skip some power on self tests (POST) while booting to decrease the time needed to boot the system. When set to [Disabled], BIOS performs all the POST items.
Configuration options: [Disabled] [Enabled]

Full Screen Logo [Enabled]

Allows you to enable or disable the full screen logo display feature.
Configuration options: [Disabled] [Enabled]

Set this item to [Enabled] to use the ASUS MyLogo2™ feature.

Bootup Num-Lock [On]

Allows you to select the power-on state for the NumLock.
Configuration options: [Off] [On]

PS/2 Mouse Support [Auto]

Allows you to enable or disable support for PS/2 mouse.
Configuration options: [Disabled] [Enabled] [Auto]

Wait for 'F1' If Error [Enabled]

When set to Enabled, the system waits for the F1 key to be pressed when error occurs. Configuration options: [Disabled] [Enabled]

Hit 'DEL' Message Display [Enabled]

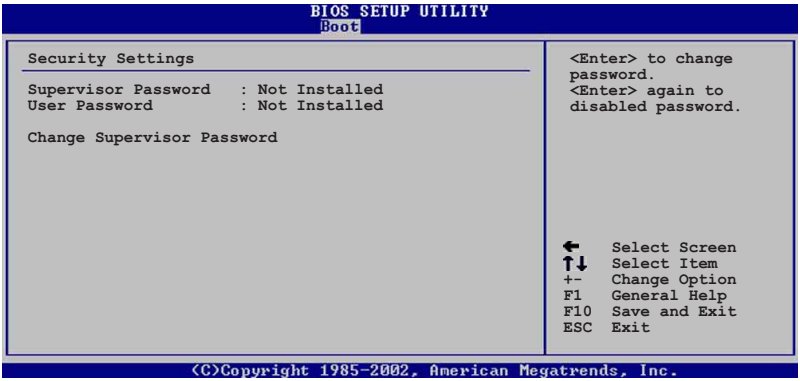
When set to Enabled, the system displays the message "Press DEL to run Setup" during POST. Configuration options: [Disabled] [Enabled]

Interrupt 19 Capture [Enabled]

When set to [Enabled], this function allows the option ROMs to trap Interrupt 19. Configuration options: [Disabled] [Enabled]

5.6.3 Security

The Security menu items allow you to change the system security settings. Select an item then press <Enter> to display the configuration options.



Change Supervisor Password

Select this item to set or change the supervisor password. The Supervisor Password item on top of the screen shows the default **Not Installed**. After you set a password, this item shows **Installed**.

To set or change a supervisor password:

1. Select the **Change Supervisor Password** item, then press <Enter>.
2. From the password box, type a password composed of at least six letters and/or numbers, then press <Enter>.
3. Confirm the password when prompted.

The message “Password Installed” appears after you successfully set your password.

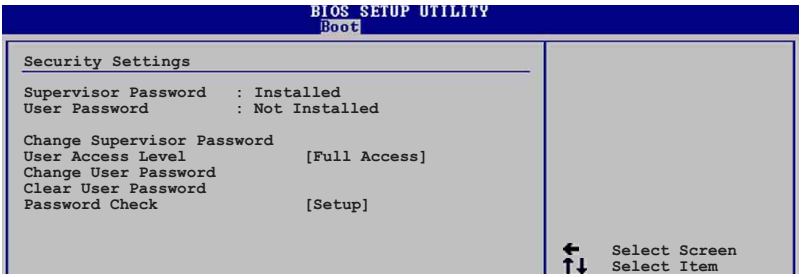
To change the supervisor password, follow the same steps as in setting a user password.

To clear the supervisor password:

Select the **Change Supervisor Password** then press <Enter>. The message “Password Uninstalled” appears.

If you forget your BIOS password, you can clear clear it by erasing the CMOS Real Time Clock (RTC) RAM. See section “2.6 Jumpers” for information on how to erase the RTC RAM.

After you have set a supervisor password, the other items appear to allow you to change other security settings.



User Access Level [Full Access]

This item allows you to select the access restriction to the Setup items. Configuration options: [No Access] [View Only] [Limited] [Full Access]

No Access prevents user access to the Setup utility.
View Only allows access but does not allow change to any field.
Limited allows changes only to selected fields, such as Date and Time.
Full Access allows viewing and changing all the fields in the Setup utility.

Change User Password

Select this item to set or change the user password. The **User Password** item on top of the screen shows the default **Not Installed**. After you set a password, this item shows **Installed**.

To set a user password:

1. Select the Change User Password item and press <Enter>.
2. On the password box that appears, type a password composed of at least six letters and/or numbers, then press <Enter>.
3. Confirm the password when prompted.

The message “Password Installed” appears after you set your password successfully.
To change the user password, follow the same steps as in setting a user password.

Clear User Password

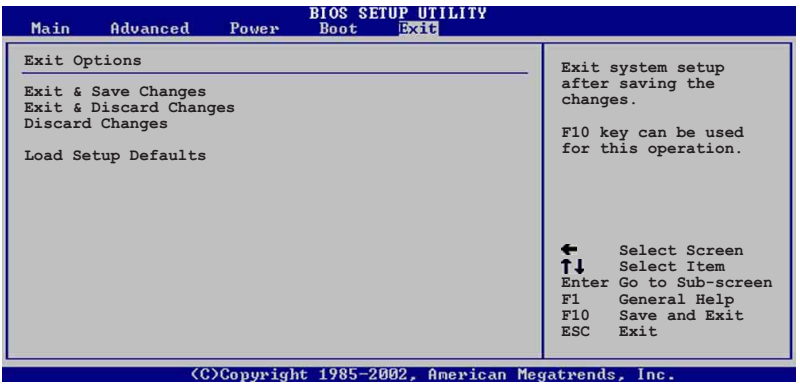
Select this item to clear the user password.

Password Check [Setup]

When set to [Setup], BIOS checks for user password when accessing the Setup utility. When set to [Always], BIOS checks for user password both when accessing Setup and booting the system.
Configuration options: [Setup] [Always]

5.7 Exit menu

The Exit menu items allow you to load the optimal or failsafe default values for the BIOS items, and save or discard your changes to the BIOS items.



If you made changes to any of the settings in the menus, pressing <Esc> does not immediately exit this menu. A confirmation window appears and prompts you to either save your changes or cancel the command. Select one of the options from this menu to exit.

Exit & Save Changes

Select this option then press <Enter>, or simply press <F10>, to save your changes to CMOS before exiting the Setup utility.

When a confirmation window appears, select [OK] then press <Enter> to save your changes and exit Setup. If you wish to cancel the command, select [Cancel] then press <Enter> to return to the Exit menu.

Exit & Discard Changes

Select this option then press <Enter> to exit the Setup utility without saving your changes.

When a confirmation window appears, select [OK] then press <Enter> to discard your changes and exit Setup. If you wish to cancel the command, select [Cancel] then press <Enter> to return to the Exit menu.

Discard Changes

Select this option then press <Enter> to discard the changes that you made, and restore the previously saved settings.

When a confirmation window appears, select [OK] then press <Enter> to discard the changes, and load the previously saved settings. If you wish to cancel the command, select [Cancel] then press <Enter> to return to the Exit menu.

Load Setup Defaults

Select this option then press <Enter> to load the optimized settings for each of the Setup menu items.

When a confirmation window appears, select [OK] then press <Enter> to load the default settings. If you wish to cancel the command, select [Cancel] then press <Enter> to return to the Exit menu.

Chapter 6

This chapter provides instructions for creating and configuring RAID, and installing the necessary drivers for different system components.

Driver installation

6.1 RAID configurations

The motherboard comes with the following RAID solutions:

- **Adaptec® HostRAID™** technology and
- **Adaptec® AIC-7901X SCSI RAID** controller supports SCSI hard disk drives and RAID 0, 1, and 0+1 configurations.

Refer to the RAID definitions below.

6.1.1 RAID definitions

RAID 0 *(Data striping)* optimizes two identical hard disk drives to read and write data in parallel, interleaved stacks. Two hard disks perform the same work as a single drive but at a sustained data transfer rate, double that of a single disk alone, thus improving data access and storage. Use of two new identical hard disk drives is required for this setup.

RAID 1 *(Data mirroring)* copies and maintains an identical image of data from one drive to a second drive. If one drive fails, the disk array management software directs all applications to the surviving drive as it contains a complete copy of the data in the other drive. This RAID configuration provides data protection and increases fault tolerance to the entire system. Use two new drives or use an existing drive and a new drive for this setup. The new drive must be of the same size or larger than the existing drive.

RAID 0+1 is *data striping* and *data mirroring* combined without parity (redundancy data) having to be calculated and written. With the RAID 0+1 configuration you get all the benefits of both RAID 0 and RAID 1 configurations. Use four new hard disk drives or use an existing drive and three new drives for this setup.

RAID 10 is *data stripe configuration* with RAID 1 segments whose segments are RAID 1arrays. This configuration has the same fault tolerance as RAID1, and has the same overhead for fault-tolerance as mirroring alone. RAID 10 achieves high input/output rates by striping RAID 1 segments. In some instances, a RAID 10 configuration can sustain multiple simultaneous drive failure. A minimum of four hard disk drives is required for this setup.

If you want to boot the system from a hard disk drive included in a created RAID set, copy first the RAID driver from the support CD to a floppy disk before you install an operating system to the selected hard disk drive. Refer to section “RAID driver installation” for details.

6.1.2 Adaptec SCSISelect(™) Utility! *(SCSI model only)*

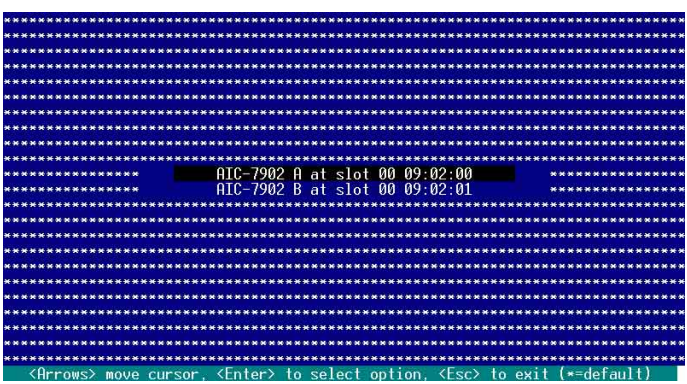
The Adaptec SCSISelect(™) Utility allows you to create RAID 0, 1, and 0+1 set(s) from SCSI hard disk drives connected to the SCSI connector supported by the Adaptec embedded SCSI controller.

To enter the Adaptec SCSISelect(™) Utility!:

1. Turn on the system after installing all the SCSI hard disk drives.
2. During POST, the Adaptec SCSI BIOS automatically detects the installed SCSI hard disk drives and displays any existing RAID set(s). Press <Ctrl> <A> to enter the utility.

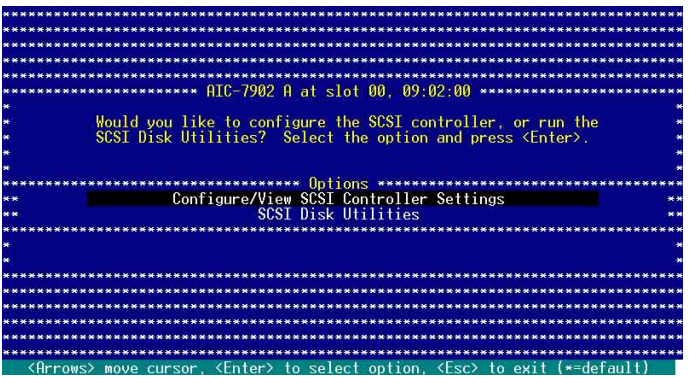
Adaptec SCSI BIOS v4.30
Copyright 2003 Adaptec, Inc. All Rights Reserved.
*** Press <Ctrl><A> for SCSISelect(TM) Utility! ***
Slot Ch ID LUN Vendor Product Size Bus Status
00 A 0 0 SEAGATE ST318432LC 18GB 16
00 A 1 0 SEAGATE ST318432LC 18GB 16
00 A 2 0 SEAGATE ST318432LC 18GB 16
00 A 11 0 SDR GEM318 8
00 B 15 0

3. The utility auto-detects the available SCSI channels. Select the SCSI channel, then press <Enter>.



Configuring the SCSI controller

You need to configure the SCSI controller before creating a RAID set. After selecting the SCSI channel to use, the utility prompts you to select from the available options. Use the arrow keys to select **Configure/View SCSI Controller Settings**, then press <Enter>.


AIC-7902 A at slot 00, 09:02:00
Would you like to configure the SCSI controller, or run the
SCSI Disk Utilities? Select the option and press <Enter>.
Options
Configure/View SCSI Controller Settings
SCSI Disk Utilities
<Arrows> move cursor, <Enter> to select option, <Esc> to exit (*=default)

Enabling the HostRAID controller

To enable the Adaptec HostRAID controller:

1. Use the arrow keys to select the **HostRAID** item in the Configuration section.
2. Press <Enter> to set the item to **Enabled**.

3. Press <Esc> to exit.
4. When the utility prompts you to save the changes, select **Yes**, then press <Enter>.

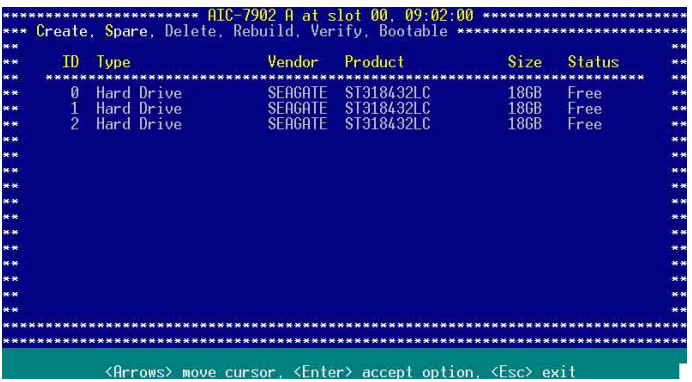
Creating a RAID 0 set (Stripe)

To create a RAID 0 set for Performance:

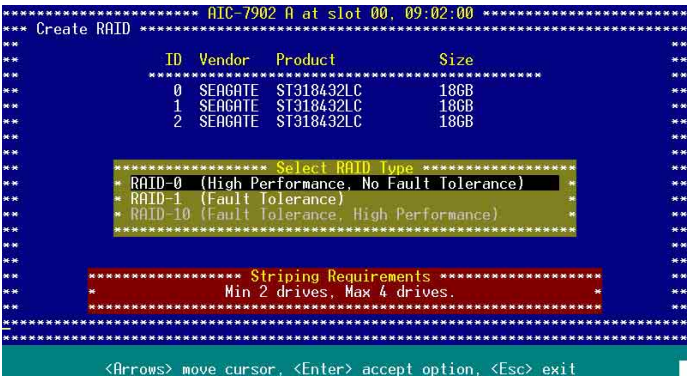
1. After enabling the HostRAID, the utility returns to the initial menu. Use the arrow keys to select **Configure/View HostRAID Settings**, then press <Enter>.

AIC-7902 A at slot 00, 09:02:00
Would you like to configure the SCSI controller, configure
the HostRAID settings, or run the SCSI Disk Utilities?
Select the option and press <Enter>.
Options
Configure/View SCSI Controller Settings
Configure/View HostRAID Settings
SCSI Disk Utilities
<Arrows> move cursor, <Enter> to select option, <Esc> to exit (*=default)

2. The utility displays the SCSI hard disk drives installed in your computer and the menu options. Press <**C**>.

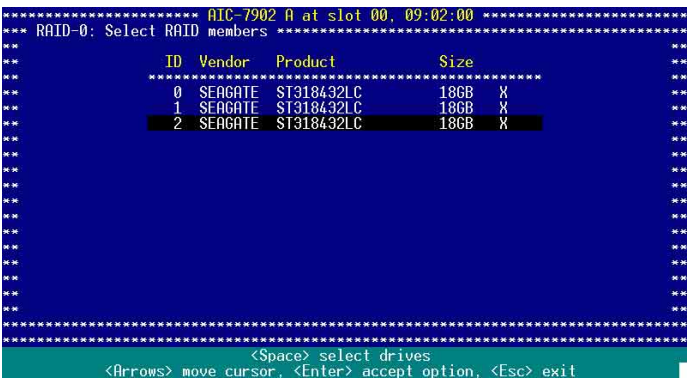

AIC-7902 A at slot 00, 09:02:00
Create, Spare, Delete, Rebuild, Verify, Bootable
ID Type Vendor Product Size Status
0 Hard Drive SEAGATE ST318432LC 18GB Free
1 Hard Drive SEAGATE ST318432LC 18GB Free
2 Hard Drive SEAGATE ST318432LC 18GB Free
<Arrows> move cursor, <Enter> accept option, <Esc> exit

3. Select **RAID-0 (High Performance, No Fault Tolerance)** from the **Select RAID Type** menu, then press <Enter>.

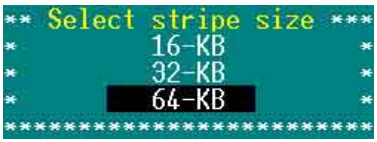

AIC-7902 A at slot 00, 09:02:00
Create RAID
ID Vendor Product Size
0 SEAGATE ST318432LC 18GB
1 SEAGATE ST318432LC 18GB
2 SEAGATE ST318432LC 18GB
Select RAID Type
RAID-0 (High Performance, No Fault Tolerance)
RAID-1 (Fault Tolerance)
RAID-10 (Fault Tolerance, High Performance)
Striping Requirements
Min 2 drives, Max 4 drives.
<Arrows> move cursor, <Enter> accept option, <Esc> exit

Refer to the **Striping Requirements** note at the bottom of the screen to determine the number of hard disk drives required for the selected RAID type.

4. Use the arrow keys to select a RAID set member, then press <SpaceBar> to mark. An **X** mark appears after the selected HDD.
5. Follow the step 4 to select the other members of the RAID set, then press <Enter> when finished.


AIC-7902 A at slot 00, 09:02:00
RAID-0: Select RAID members
ID Vendor Product Size
0 SEAGATE ST318432LC 18GB X
1 SEAGATE ST318432LC 18GB X
2 SEAGATE ST318432LC 18GB X
<Space> select drives
<Arrows> move cursor, <Enter> accept option, <Esc> exit

6. Select the stripe size from the menu, then press <Enter>.



For server systems, we recommend that you use a lower array block size. For multimedia computer systems used mainly for audio and video editing, we recommend a higher array block size for optimum performance.

7. When prompted, use the keyboard to assign a name for the RAID 0 set, then press <Enter>.

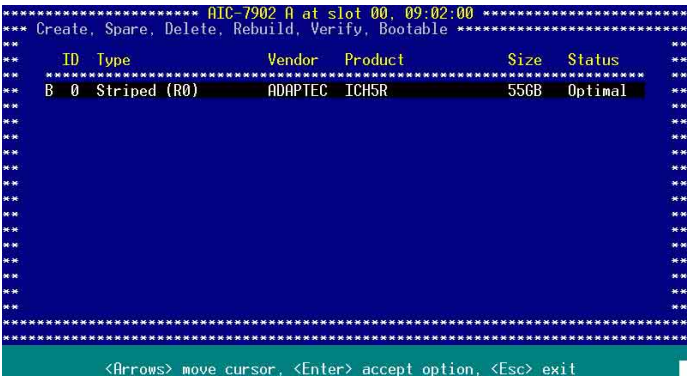
8. If you want to make the array bootable, select **Yes** from the menu, then press <Enter>.

9. When prompted to create the RAID 0 set, select <Yes>, then press <Enter>.

The utility erases all data from the selected hard disk drives. Make sure to backup all important data before creating a RAID set.

A **Build Complete** message appears to indicate that you have successfully created the RAID 0 set.

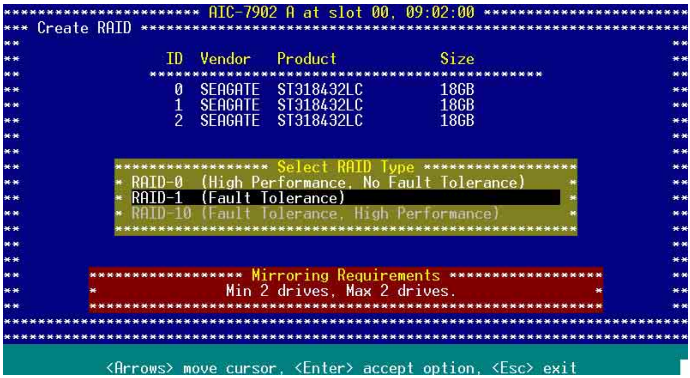
10. The screen displays the information on the created RAID set. Press <Esc> to exit the utility.


AIC-7902 A at slot 00, 09:02:00
Create, Spare, Delete, Rebuild, Verify, Bootable
ID Type Vendor Product Size Status
B 0 Striped (R0) ADAPTEC ICH5R 55GB Optimal
<Arrows> move cursor, <Enter> accept option, <Esc> exit

Creating a RAID 1 set (Mirror)

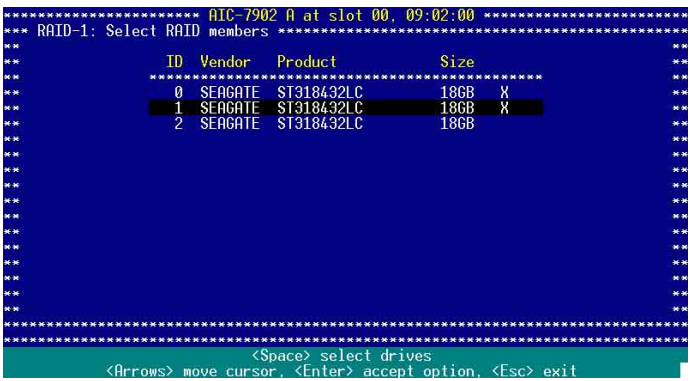
To create a RAID 1 set for Fault Tolerance:

1. Follow steps 1 to 2 of the **Creating a RAID 0 set** section.
2. Select **RAID-1 (Fault Tolerance)** from the **Select RAID Type** menu, then press <Enter>.


AIC-7902 A at slot 00, 09:02:00
Create RAID
ID Vendor Product Size
0 SEAGATE ST318432LC 18GB
1 SEAGATE ST318432LC 18GB
2 SEAGATE ST318432LC 18GB
Select RAID Type
RAID-0 (High Performance, No Fault Tolerance)
RAID-1 (Fault Tolerance)
RAID-10 (Fault Tolerance, High Performance)
Mirroring Requirements
Min 2 drives, Max 2 drives.
<Arrows> move cursor, <Enter> accept option, <Esc> exit

Refer to the **Striping Requirements** note at the bottom of the screen to determine the number of hard disk drives required for the selected RAID type.

3. Use the arrow keys to select a RAID set member, then press <SpaceBar> to mark. An **X** mark appears after the selected HDD.
4. Follow step 3 to select the other members of the RAID set, then press <Enter> when finished.


AIC-7902 A at slot 00, 09:02:00
RAID-1: Select RAID members
ID Vendor Product Size
0 SEAGATE ST318432LC 18GB X
1 SEAGATE ST318432LC 18GB X
2 SEAGATE ST318432LC 18GB
<Space> select drives
<Arrows> move cursor, <Enter> accept option, <Esc> exit

6. Select **Create new RAID-1** from the RAID-1 Build Option menu, then press <Enter>.

The RAID-1 Build Option menu also allows you to create a RAID 1 set from a RAID 0 set or vice-versa.

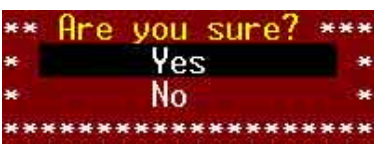
7. When prompted, use the keyboard to assign a name for the RAID 1 set, then press <Enter>.

8. If you want to make the array bootable, select **Yes** from the menu, then press <Enter>.

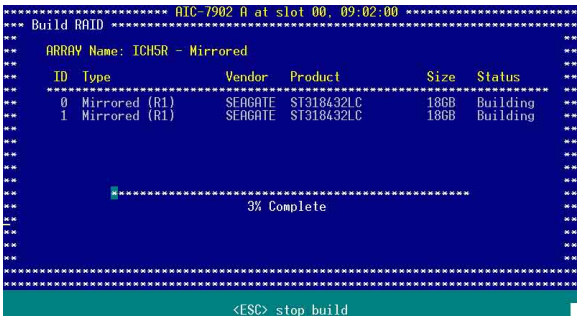
9. When prompted to create the RAID 1 set, select <Yes>, then press <Enter>.

The utility erases all data from the selected hard disk drives. Make sure to backup all important data before creating a RAID set.

10. When a confirmation dialogue box appears, select <Yes>, then press <Enter>.

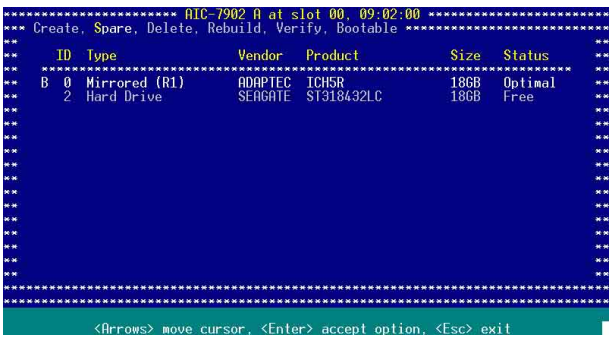


11. The utility builds the RAID 1 set and displays a progress bar at the center of the screen. Press <Esc> if you want to stop the building process.


AIC-7902 A at slot 00, 09:02:00
Build RAID
ARRAY Name: ICH5R - Mirrored
ID Type Vendor Product Size Status
0 Mirrored (R1) SEAGATE ST318432LC 18GB Building
1 Mirrored (R1) SEAGATE ST318432LC 18GB Building
3% Complete
<ESC> stop build

A **Build Complete** message appears to indicate that you have successfully created the RAID 1 set.

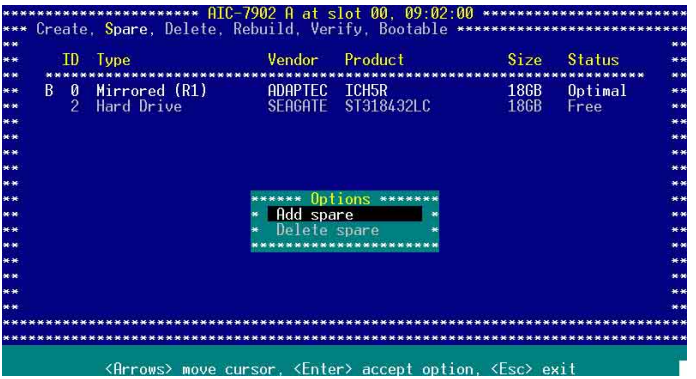
12. The screen displays the information on the created RAID set. Press <Esc> to exit the utility.


AIC-7902 A at slot 00, 09:02:00
Create, Spare, Delete, Rebuild, Verify, Bootable
ID Type Vendor Product Size Status
B 0 Mirrored (R1) ADAPTEC ICH5R 18GB Optimal
2 Hard Drive SEAGATE ST318432LC 18GB Free
<Arrows> move cursor, <Enter> accept option, <Esc> exit

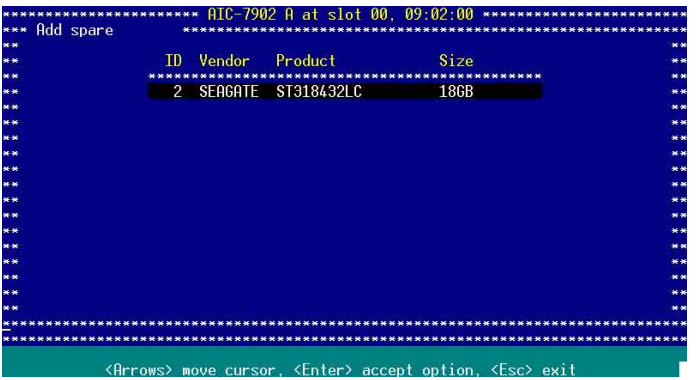
Adding a spare drive to a RAID 1 set

To add a spare drive to a RAID 1 set:

1. Press <S> from the **Configure/View Host RAID Settings** menu.
2. Select **Add Spare** from the Options menu, then press <Enter>.

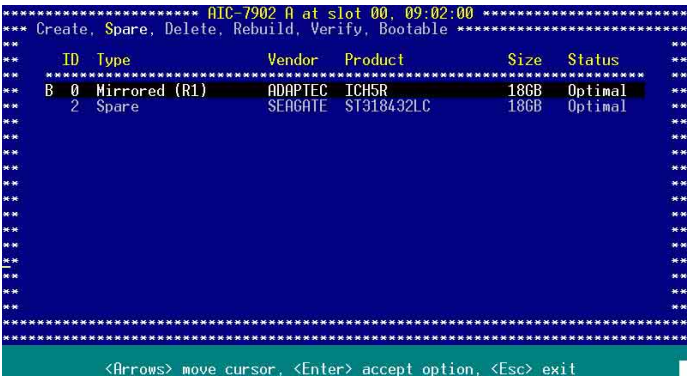

AIC-7902 A at slot 00, 09:02:00
Create, Spare, Delete, Rebuild, Verify, Bootable
ID Type Vendor Product Size Status
B 0 Mirrored (R1) ADAPTEC ICH5R 18GB Optimal
2 Hard Drive SEAGATE ST318432LC 18GB Free
Options
Add spare
Delete spare
<Arrows> move cursor, <Enter> accept option, <Esc> exit

3. Use the arrow keys to select the spare drive from the list, then press <Enter>.



4. When a confirmation dialogue box appears, select <Yes>, then press <Enter>.

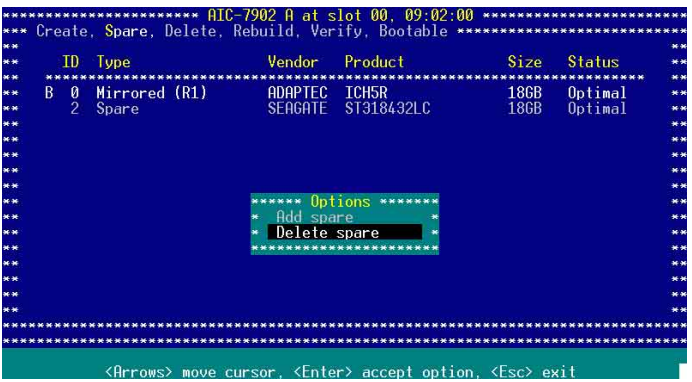
5. The screen displays the information on the added spare drive. Press <Esc> to exit the utility.


AIC-7902 A at slot 00, 09:02:00
Create, Spare, Delete, Rebuild, Verify, Bootable
ID Type Vendor Product Size Status
B 0 Mirrored (R1) ADAPTEC ICH5R 18GB Optimal
2 Spare SEAGATE ST318432LC 18GB Optimal
<Arrows> move cursor, <Enter> accept option, <Esc> exit

Deleting a RAID 1 set spare drive

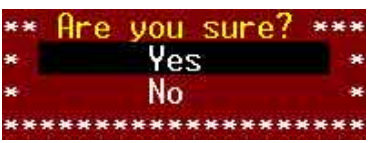
To delete a RAID 1 set spare drive:

1. From the utility main menu, press <**S**>, select **Delete Spare** from the Options menu, then press <Enter>.


AIC-7902 A at slot 00, 09:02:00
Create, Spare, Delete, Rebuild, Verify, Bootable
ID Type Vendor Product Size Status
B 0 Mirrored (R1) ADAPTEC ICH5R 18GB Optimal
2 Spare SEAGATE ST318432LC 18GB Optimal
****** Options ******
Add spare
Delete spare
<Arrows> move cursor, <Enter> accept option, <Esc> exit

2. The screen displays the available spare drive(s). Use the arrow keys to select the spare drive you want to delete, then press <Enter>.

3. When a confirmation dialogue box appears, select <Yes>, then press <Enter> to delete the spare drive.



4. Press <ESC> to exit the utility.

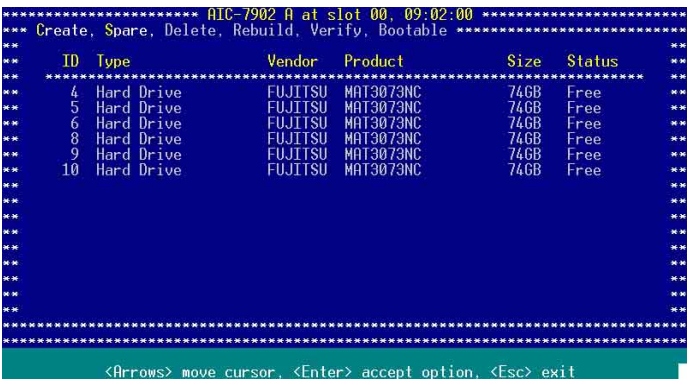
Creating a RAID 10 set (Stripe+Mirror)

To create a RAID 10 set for Fault Tolerance and Performance:

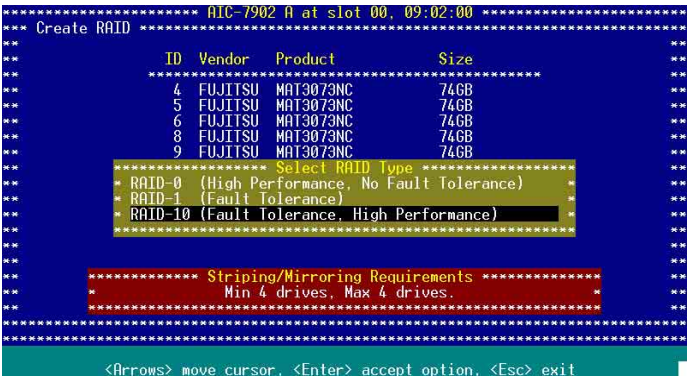
1. After enabling the HostRAID, the utility returns to the initial menu. Use the arrow keys to select **Configure/View HostRAID Settings**, then press <Enter>.

AIC-7902 A at slot 00, 09:02:00
Would you like to configure the SCSI controller, configure
the HostRAID settings, or run the SCSI Disk Utilities?
Select the option and press <Enter>.
Options
Configure/View SCSI Controller Settings
Configure/View HostRAID Settings
SCSI Disk Utilities
<Arrows> move cursor, <Enter> to select option, <Esc> to exit (*=default)

2. The utility displays the SCSI hard disk drives installed in your computer and the menu options. Press <**C**>.

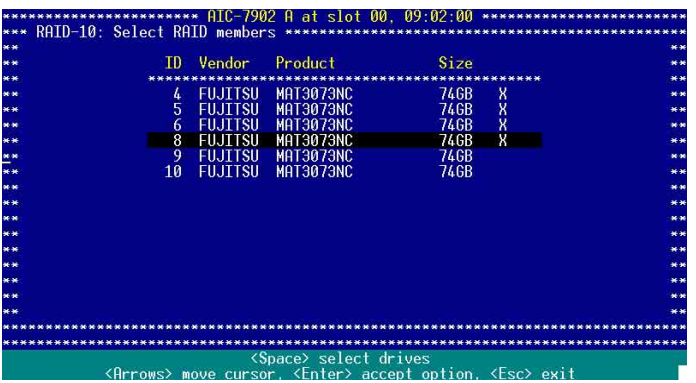

AIC-7902 A at slot 00, 09:02:00
*** Create, Spare, Delete, Rebuild, Verify, Bootable ***
ID Type Vendor Product Size Status
4 Hard Drive FUJITSU MAT3073NC 74GB Free
5 Hard Drive FUJITSU MAT3073NC 74GB Free
6 Hard Drive FUJITSU MAT3073NC 74GB Free
8 Hard Drive FUJITSU MAT3073NC 74GB Free
9 Hard Drive FUJITSU MAT3073NC 74GB Free
10 Hard Drive FUJITSU MAT3073NC 74GB Free
<Arrows> move cursor, <Enter> accept option, <Esc> exit

3. Select **RAID-10 (Fault Tolerance, High Performance)** from the **Select RAID Type** menu, then press <Enter>.

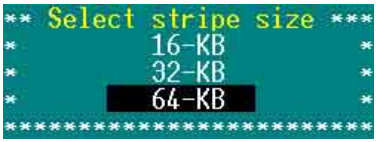

AIC-7902 A at slot 00, 09:02:00
Create RAID
ID Vendor Product Size
4 FUJITSU MAT3073NC 74GB
5 FUJITSU MAT3073NC 74GB
6 FUJITSU MAT3073NC 74GB
8 FUJITSU MAT3073NC 74GB
9 FUJITSU MAT3073NC 74GB
Select RAID Type
RAID-0 (High Performance, No Fault Tolerance)
RAID-1 (Fault Tolerance)
RAID-10 (Fault Tolerance, High Performance)
Striping/Mirroring Requirements
Min 4 drives, Max 4 drives.
<Arrows> move cursor, <Enter> accept option, <Esc> exit

Refer to the **Striping/Mirroring Requirements** note at the bottom of the screen to determine the number of hard disk drives required for the selected RAID type.

4. Use the arrow keys to select a RAID set member, then press <SpaceBar> to mark. An **X** mark appears after the selected HDD.
5. Follow the step 4 to select the other members of the RAID set, then press <Enter> when finished.


AIC-7902 A at slot 00, 09:02:00
RAID-10: Select RAID members
ID Vendor Product Size
4 FUJITSU MAT3073NC 74GB X
5 FUJITSU MAT3073NC 74GB X
6 FUJITSU MAT3073NC 74GB X
8 FUJITSU MAT3073NC 74GB X
9 FUJITSU MAT3073NC 74GB
10 FUJITSU MAT3073NC 74GB
<Space> select drives
<Arrows> move cursor, <Enter> accept option, <Esc> exit

6. Select the stripe size from the menu, then press <Enter>.



For server systems, we recommend that you use a lower array block size. For multimedia computer systems used mainly for audio and video editing, we recommend a higher array block size for optimum performance.

7. When prompted, use the keyboard to assign a name for the RAID 10 set, then press <Enter>.

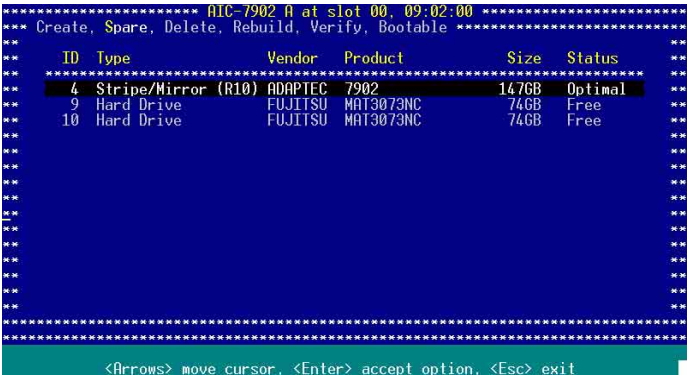
8. If you want to make the array bootable, select **Yes** from the menu, then press <Enter>.

9. When prompted to create the RAID 10 set, select <Yes>, then press <Enter>.

The utility erases all data from the selected hard disk drives. Make sure to backup all important data before creating a RAID set.

A **Build Complete** message appears to indicate that you have successfully created the RAID 10 set.

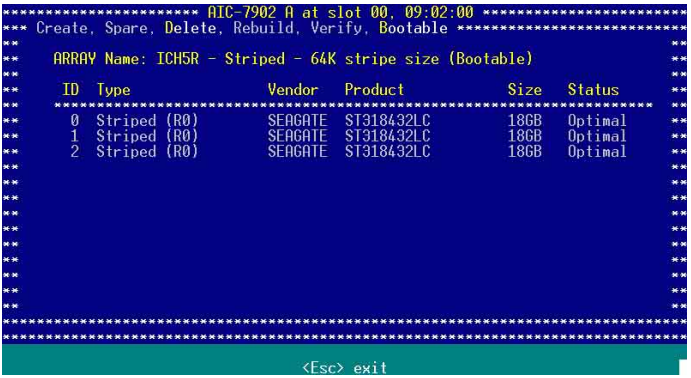
10. The screen displays the information on the created RAID set. Press <Esc> to exit the utility.


AIC-7902 A at slot 00, 09:02:00
Create, Spare, Delete, Rebuild, Verify, Bootable
ID Type Vendor Product Size Status
4 Stripe/Mirror (R10) ADAPTEC 7902 147GB Optimal
9 Hard Drive FUJITSU MAT3073NC 74GB Free
10 Hard Drive FUJITSU MAT3073NC 74GB Free
<Arrows> move cursor, <Enter> accept option, <Esc> exit

Deleting a RAID set

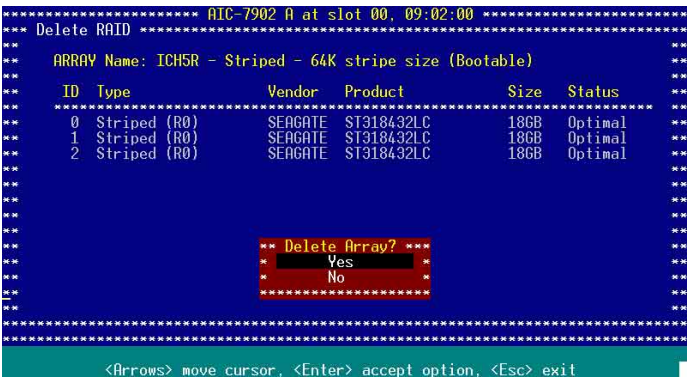
To delete a RAID set:

1. Press <**D**> from the **Configure/View Host RAID Settings** menu.


AIC-7902 A at slot 00, 09:02:00
Create, Spare, Delete, Rebuild, Verify, Bootable
ARRAY Name: ICH5R - Striped - 64K stripe size (Bootable)
ID Type Vendor Product Size Status
0 Striped (R0) SEAGATE ST318432LC 18GB Optimal
1 Striped (R0) SEAGATE ST318432LC 18GB Optimal
2 Striped (R0) SEAGATE ST318432LC 18GB Optimal
<Esc> exit

You lose all data on the hard disk drives when you delete a RAID set. Make sure to backup all important data before deleting a RAID set.

2. When prompted, select **Yes** from the Delete Array menu, then press <Enter> to delete the RAID set.


AIC-7902 A at slot 00, 09:02:00
Delete RAID
ARRAY Name: ICH5R - Striped - 64K stripe size (Bootable)
ID Type Vendor Product Size Status
0 Striped (R0) SEAGATE ST318432LC 18GB Optimal
1 Striped (R0) SEAGATE ST318432LC 18GB Optimal
2 Striped (R0) SEAGATE ST318432LC 18GB Optimal
** Delete Array? ***
Yes
No
<Arrows> move cursor, <Enter> accept option, <Esc> exit

3. Press <ESC> to exit the utility.

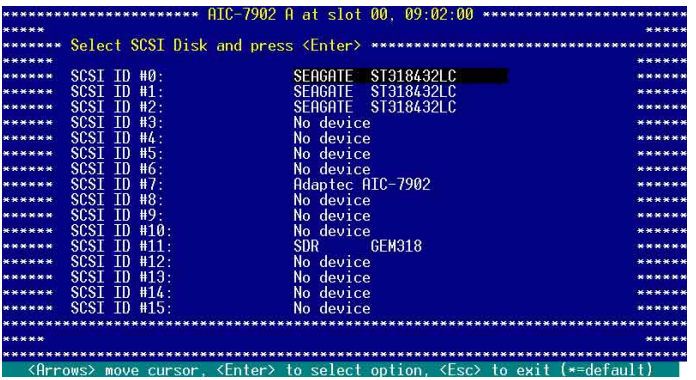
Verifying a RAID set hard disk drive

To verify a RAID set hard disk drive:

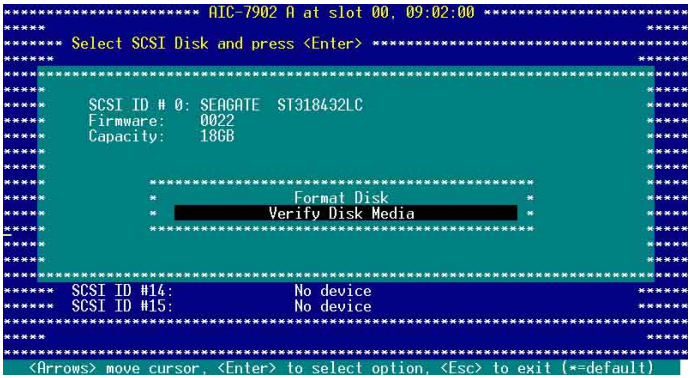
1. Select **SCSI Disk Utilities** from the main menu options, then press <Enter>.

AIC-7902 A at slot 00, 09:02:00
Would you like to configure the SCSI controller, configure the HostRAID settings, or run the SCSI Disk Utilities? Select the option and press <Enter>.
Options
Configure/View SCSI Controller Settings
Configure/View HostRAID Settings
SCSI Disk Utilities
<Arrows> move cursor, <Enter> to select option, <Esc> to exit (*=default)

2. The screen displays the RAID set drives. Use the arrow keys to select the hard disk drive you want to verify, then press <Enter>.


AIC-7902 A at slot 00, 09:02:00
Select SCSI Disk and press <Enter>
SCSI ID #0: SEAGATE ST318432LC
SCSI ID #1: SEAGATE ST318432LC
SCSI ID #2: SEAGATE ST318432LC
SCSI ID #3: No device
SCSI ID #4: No device
SCSI ID #5: No device
SCSI ID #6: No device
SCSI ID #7: Adaptec AIC-7902
SCSI ID #8: No device
SCSI ID #9: No device
SCSI ID #10: No device
SCSI ID #11: SDR GEM318
SCSI ID #12: No device
SCSI ID #13: No device
SCSI ID #14: No device
SCSI ID #15: No device
<Arrows> move cursor, <Enter> to select option, <Esc> to exit (*=default)

3. Select **Verify Disk Media** from the menu, then press <Enter>.


AIC-7902 A at slot 00, 09:02:00
Select SCSI Disk and press <Enter>
SCSI ID # 0: SEAGATE ST318432LC
Firmware: 0022
Capacity: 18GB
Format Disk
Verify Disk Media
SCSI ID #14: No device
SCSI ID #15: No device
<Arrows> move cursor, <Enter> to select option, <Esc> to exit (*=default)

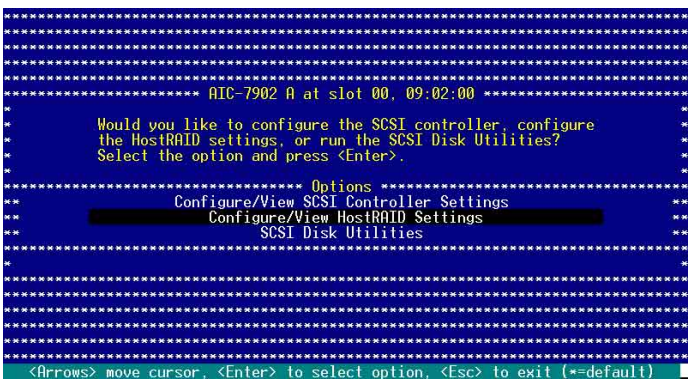
You can also use the SCSI Disk Utilities to format the hard disk drive.

4. After verifying the hard disk drive, press <Esc> to exit the utility.

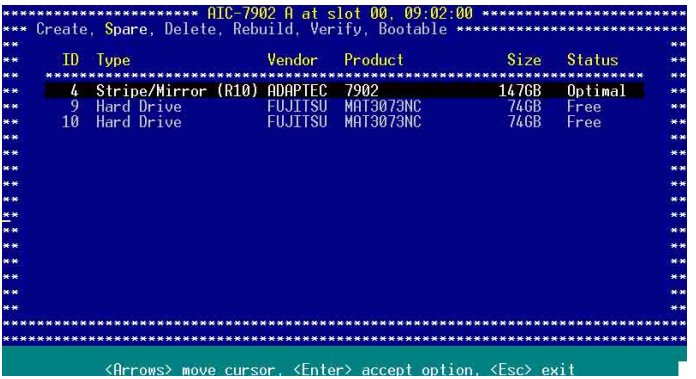
Making a RAID set bootable

To make a RAID set bootable:

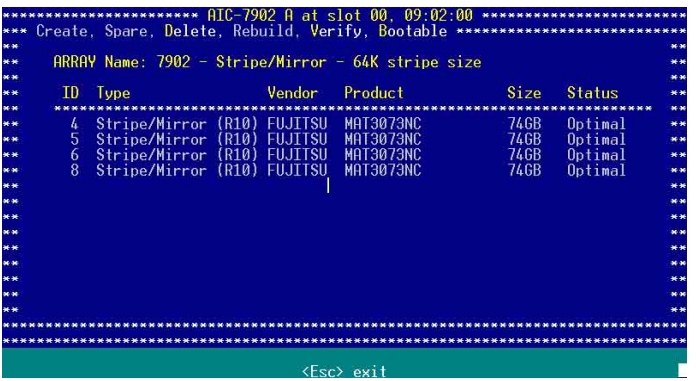
1. Select **SCSI Disk Utilities** from the main menu options, then press <Enter>.


AIC-7902 A at slot 00, 09:02:00
Would you like to configure the SCSI controller, configure
the HostRAID settings, or run the SCSI Disk Utilities?
Select the option and press <Enter>.
Options
Configure/View SCSI Controller Settings
Configure/View HostRAID Settings
SCSI Disk Utilities
<Arrows> move cursor, <Enter> to select option, <Esc> to exit (*=default)

2. Select the RAID set you want to make bootable, then press <Enter>.


AIC-7902 A at slot 00, 09:02:00
Create, Spare, Delete, Rebuild, Verify, Bootable
ID Type Vendor Product Size Status
4 Stripe/Mirror (R10) ADAPTEC 7902 147GB Optimal
9 Hard Drive FUJITSU MAT3073NC 74GB Free
10 Hard Drive FUJITSU MAT3073NC 74GB Free
<Arrows> move cursor, <Enter> accept option, <Esc> exit

3. Press **<B>** when the RAID set information displays on screen.


AIC-7902 A at slot 00, 09:02:00
Create, Spare, Delete, Rebuild, Verify, Bootable
ARRAY Name: 7902 - Stripe/Mirror - 64K stripe size
ID Type Vendor Product Size Status
4 Stripe/Mirror (R10) FUJITSU MAT3073NC 74GB Optimal
5 Stripe/Mirror (R10) FUJITSU MAT3073NC 74GB Optimal
6 Stripe/Mirror (R10) FUJITSU MAT3073NC 74GB Optimal
8 Stripe/Mirror (R10) FUJITSU MAT3073NC 74GB Optimal
<Esc> exit

4. When prompted, select **Mark bootable**, then press <Enter>.

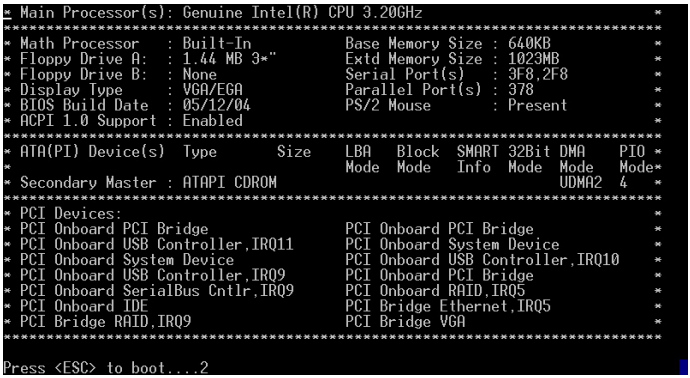
The letter "**B**" appears before a bootable RAID set for easy identification.

AIC-7902 A at slot 00, 09:02:00
Create, Spare, Delete, Rebuild, Verify, Bootable
ID Type Vendor Product Size Status
B 4 Stripe/Mirror (R10) ADAPTEC 7902 147GB Optimal
9 Hard Drive FUJITSU MAT3073NC 74GB Free
10 Hard Drive FUJITSU MAT3073NC 74GB Free

Booting from a RAID set

To boot from a RAID set:

1. During POST, press <F8> or <Esc> to select the boot device.


* Main Processor(s): Genuine Intel(R) CPU 3.20GHz
* Math Processor : Built-In
* Floppy Drive A: : 1.44 MB 3*"
* Floppy Drive B: : None
* Display Type : VGA/EGA
* BIOS Build Date : 05/12/04
* ACPI 1.0 Support : Enabled
Base Memory Size : 640KB
Extd Memory Size : 1023MB
Serial Port(s) : 3F8,2F8
Parallel Port(s) : 378
PS/2 Mouse : Present
* ATA(PI) Device(s) Type Size LBA Mode Block Mode SMART Info 32Bit Mode DMA Mode PIO Mode
* Secondary Master : ATAPI CDROM UDMA2 4
* PCI Devices:
* PCI Onboard PCI Bridge
* PCI Onboard USB Controller,IRQ11
* PCI Onboard System Device
* PCI Onboard USB Controller,IRQ9
* PCI Onboard SerialBus Cntlr,IRQ9
* PCI Onboard IDE
* PCI Bridge RAID,IRQ9
PCI Onboard PCI Bridge
PCI Onboard System Device
PCI Onboard USB Controller,IRQ10
PCI Onboard PCI Bridge
PCI Onboard RAID,IRQ5
PCI Bridge Ethernet,IRQ5
PCI Bridge VGA
Press <ESC> to boot....2

2. Use the up or down arrow key to highlight the bootable RAID set, then press <Enter> to select. The system restarts, then boots from the RAID set.

Please select boot device:
1st FLOPPY DRIVE
SM-ASUS DVD-ROM E616
00,AIC-7902A: 0 ADAPTEC ICH5R
MBA v7.6.3 Slot 0600
* and * to move selection
ENTER to select boot device
ESC to boot using defaults

6.2 RAID driver installation

After creating the RAID sets for your server system, you are now ready to install an operating system to the independent hard disk drive or bootable array. This part provides instructions on how to install the RAID controller drivers during OS installation.

6.2.1 Creating a RAID driver disk

You may have to use another system to create the RAID driver disk from the system/motherboard support CD or from the Internet.

Windows® 2000/2003 Server

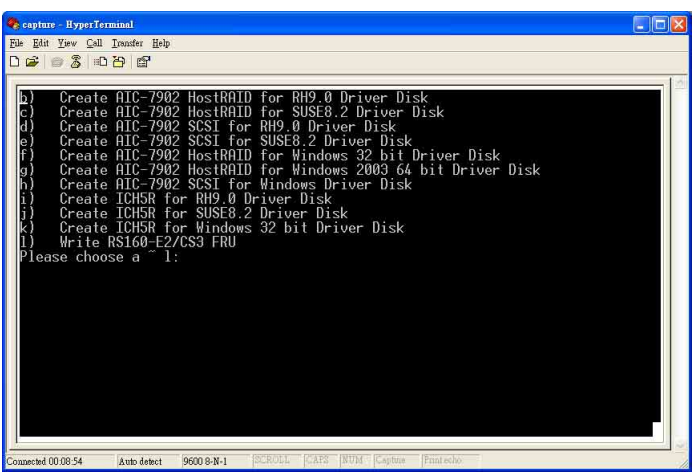
A floppy disk with the RAID driver is required when installing Windows® 2000/ 2003 Server operating system on a hard disk drive that is assigned to an array.

To create a RAID driver disk from Windows® environment:

1. Place the system or motherboard support CD in the optical drive.
2. When the **Drivers** menu appears, select the RAID driver disk you want to create.

   OR

   Browse the contents of the support CD to locate the driver disk utility.
3. Insert a formatted high-density floppy disk to the floppy disk drive.
4. Follow screen instructions to complete the process.
5. After creating a RAID driver disk, eject the floppy disk, then write-protect it to prevent computer virus infection.


capture - HyperTerminal
File Edit View Call Transfer Help
b) Create AIC-7902 HostRAID for RH9.0 Driver Disk
c) Create AIC-7902 HostRAID for SUSE8.2 Driver Disk
d) Create AIC-7902 SCSI for RH9.0 Driver Disk
e) Create AIC-7902 SCSI for SUSE8.2 Driver Disk
f) Create AIC-7902 HostRAID for Windows 32 bit Driver Disk
g) Create AIC-7902 HostRAID for Windows 2003 64 bit Driver Disk
h) Create AIC-7902 SCSI for Windows Driver Disk
i) Create ICH5R for RH9.0 Driver Disk
j) Create ICH5R for SUSE8.2 Driver Disk
k) Create ICH5R for Windows 32 bit Driver Disk
l) Write RS160-E2/CS3 FRU
Please choose a ~ l:
Connected 00:08:54
Auto detect
9600 8-N-1
SCROLL
CAPS
NUM
Capture
Print echo

Red Hat® Linux 9.0

To create a RAID driver disk for Red Hat® Linux system:

1. Insert a blank formatted high-density floppy disk to the floppy disk drive.
2. Decompress the zipped file into the floppy disk from the following path in the support CD:

   For **Adaptec® AIC-7902** RAID driver disk :

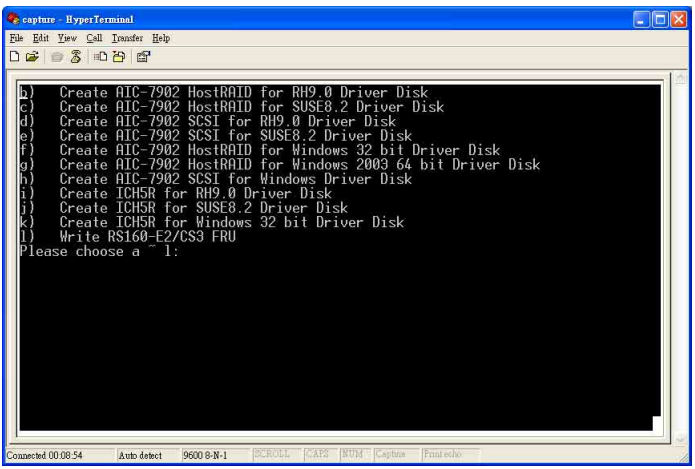
   \Drivers\AIC7902\HostRAID\MakeDisk\rh9.zip

3. Eject the floppy disk.

OR

Browse the contents of the support CD to locate the driver disk utility.

1. Insert a formatted high-density floppy disk to the floppy disk drive.
2. Follow screen instructions to complete the process.
3. After creating a RAID driver disk, eject the floppy disk, then write-protect it to prevent computer virus infection.


capture - HyperTerminal
File Edit View Call Transfer Help
b) Create AIC-7902 HostRAID for RH9.0 Driver Disk
c) Create AIC-7902 HostRAID for SUSE8.2 Driver Disk
d) Create AIC-7902 SCSI for RH9.0 Driver Disk
e) Create AIC-7902 SCSI for SUSE8.2 Driver Disk
f) Create AIC-7902 HostRAID for Windows 32 bit Driver Disk
g) Create AIC-7902 HostRAID for Windows 2003 64 bit Driver Disk
h) Create AIC-7902 SCSI for Windows Driver Disk
i) Create ICH5R for RH9.0 Driver Disk
j) Create ICH5R for SUSE8.2 Driver Disk
k) Create ICH5R for Windows 32 bit Driver Disk
l) Write RS160-E2/CS3 FRU
Please choose a ~ l:
Connected 00:08:54
Auto detect
9600 8-N-1
SCROLL
CAPS
NUM
Capture
Print echo

You may find other Linux base drive in directory E:\Driver\Adapter\HostRAID\driver\linux("E:" is your CD-ROM number).

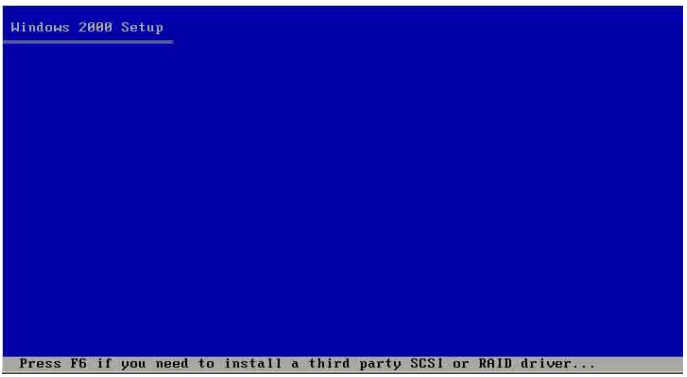
6.2.2 Installing the RAID controller driver

Windows® 2000/2003 Server OS

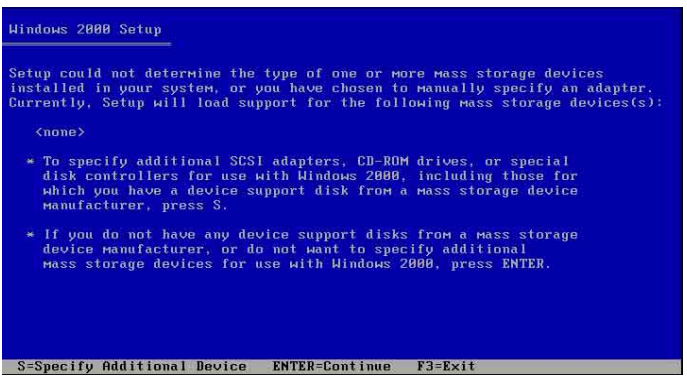
During Windows® 2000/2003 Server OS installation

To install the RAID controller driver when installing Windows® 2000/2003 Server OS:

1. Boot the computer using the Windows® 2000/2003 Server installation CD. The **Windows® 2000/2003 Setup** starts.



2. Press <F6> when the message "**Press F6 if you need to install a third party SCSI or RAID driver...**" appears at the bottom of the screen.
3. When prompted, press <**S**> to specify an additional device.


Windows 2000 Setup
Setup could not determine the type of one or more mass storage devices installed in your system, or you have chosen to manually specify an adapter. Currently, Setup will load support for the following mass storage devices(s):
<none>
* To specify additional SCSI adapters, CD-ROM drives, or special disk controllers for use with Windows 2000, including those for which you have a device support disk from a mass storage device manufacturer, press S.
* If you do not have any device support disks from a mass storage device manufacturer, or do not want to specify additional mass storage devices for use with Windows 2000, press ENTER.
S=Specify Additional Device ENTER=Continue F3=Exit

4. Insert the RAID driver disk you created earlier to the floppy disk drive, then press <Enter>.

5. Select the RAID controller driver from the list, then press <Enter>.

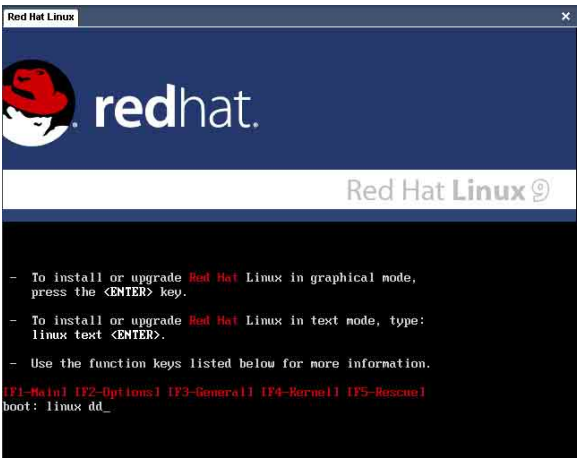
   - For **Adaptec® 7902 HostRAID** driver, select **Adaptec HostRAID U320 Diver ver. 1.02 for Windows 2000/XP/2003**.

6. The Windows® 2000/2003 Setup loads the RAID controller drivers from the RAID driver disk. When prompted, press <Enter> to continue installation.
7. Setup then proceeds with the OS installation. Follow screen instructions to continue.

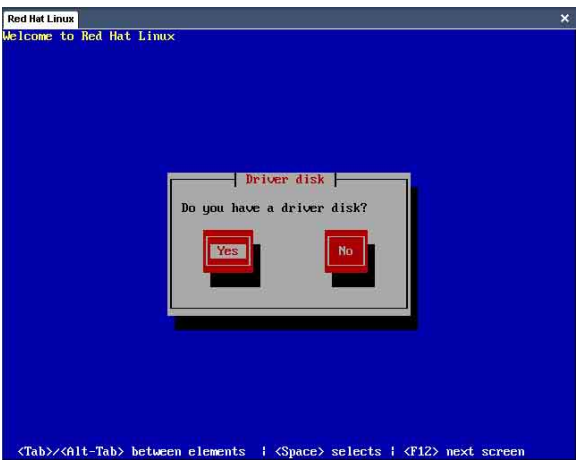
Red Hat® Linux 9.0

To install the RAID controller driver when installing Red Hat® Linux 9.0 OS:

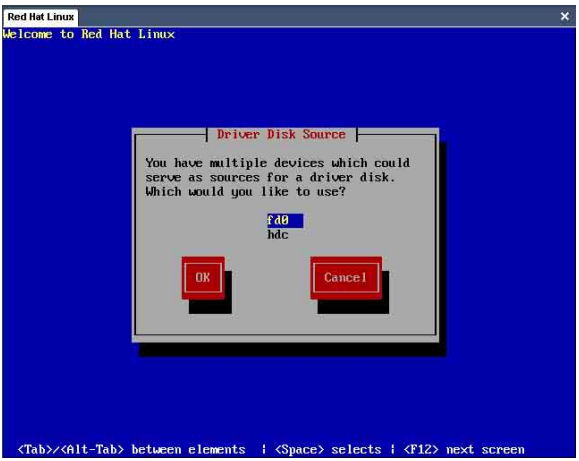
1. Boot the system from the Red Hat® Installation CD.
2. At the **boot:**, type **linux dd** , then press <Enter>.


Red Hat Linux
redhat.
Red Hat Linux 9
- To install or upgrade Red Hat Linux in graphical mode, press the <ENTER> key.
- To install or upgrade Red Hat Linux in text mode, type: linux text <ENTER>.
- Use the function keys listed below for more information.
[F1-Main] [F2-Options] [F3-General] [F4-Kernel] [F5-Rescue]
boot: linux dd_

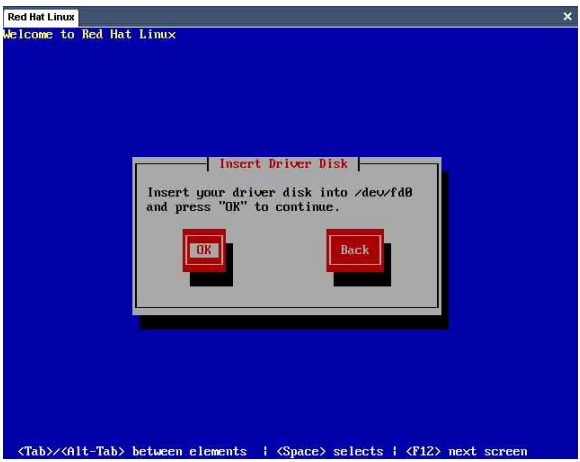
3. Select **Yes** using the <Tab> key when asked if you have the driver disk. Press <Enter>



4. Select **fd0** using the <Tab> key when asked to select the driver disk source. Press <Tab> to move the cursor to **OK**, then press <Enter>.

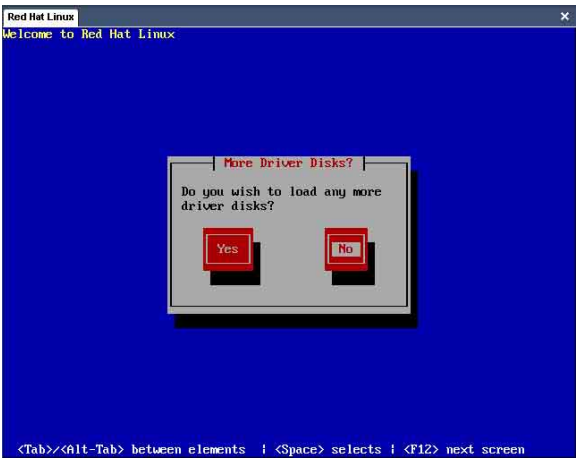


5. When prompted, insert the Red Hat® Linux 9.0 RAID driver disk to the floppy disk drive, select **OK,** then press <Enter>.



The drivers for the RAID controller are installed to the system.

6. When asked if you will load additional RAID controller drivers:
   - For IDE model, select **No**, then press <Enter>
   - For SATA/SCSI model, select **Yes**, then install the additional RAID controller drivers (AIC-8110X or AIC-7901X).



7. Follow screen instructions to continue the OS installation.

6.3 LAN driver installation

This section provides instructions on how to install the Broadcom® Gigabit LAN controller drivers.

6.3.1 Windows® 2000/2003 Server

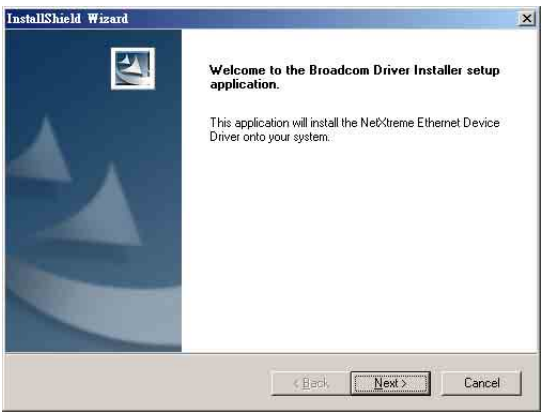
To install the Broadcom® Gigabit LAN controller driver on a Windows® 2000/2003 Server OS :

1. Restart the computer, then log on with **Administrator** privileges.
2. Insert the motherboard/system support CD to the optical drive. The CD automatically displays the **Drivers** menu if Autorun is enabled in your computer.

- Windows® automatically detects the LAN controllers and displays a **New Hardware Found** window. Click **Cancel** to close this window.
- If **Autorun** is NOT enabled in your computer, browse the contents of the support CD to locate the file ASSETUP.EXE from the BIN folder. Double-click the **ASSETUP.EXE** to run the CD.

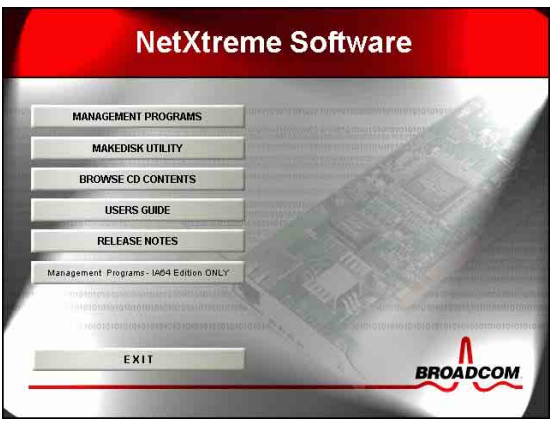
3. Click the **Broadcom 5721 LAN Driver** option to begin installation.

4. Click **Next** when the InstallShield Wizard window appears. Follow screen instructions to continue installation.


InstallShield Wizard
Welcome to the Broadcom Driver Installer setup application.
This application will install the NetXtreme Ethernet Device Driver onto your system.
< Back
Next >
Cancel

6.3.2 Install Broadcom NetXtreme Software

This section provides instructions on how to install the Broadcom® NetXtreme Software. Refer the "USERS GUIDE" for details.



6.4 VGA driver installation

This section provides instructions on how to install the ATI® RAGE XL Video Graphics Adapter (VGA) driver.

6.4.1 Windows® 2000 Server

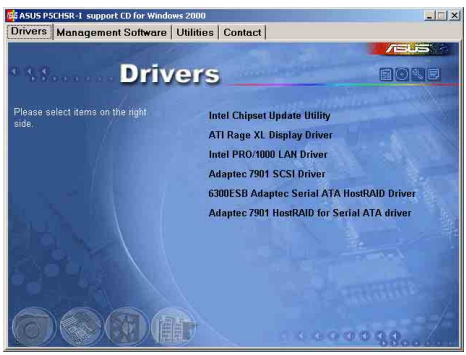
You need to manually install the ATI® RAGE XL VGA driver on a Windows® 2000 Server operating system.

To install the ATI® RAGE XL VGA driver:

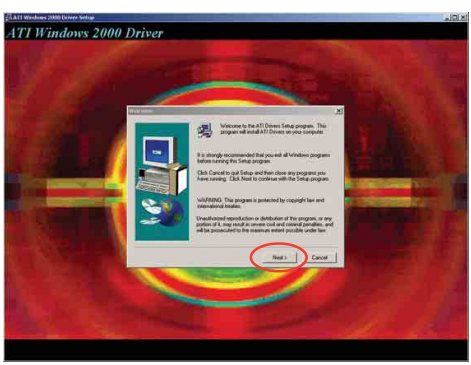
1. Restart the computer, then log on with **Administrator** privileges.
2. Insert the motherboard/system support CD to the optical drive. The support CD automatically displays the **Drivers** menu if Autorun is enabled in your computer.

Windows® automatically detects the LAN controller and displays a **New Hardware Found** window. Click **Cancel** to close this window.

3. Click the item **ATI Rage XL Display Driver** from the **Drivers** menu.



4. The **ATI Windows 2000 Driver** window appears. Click **Next**. Follow screen instructions to complete installation.



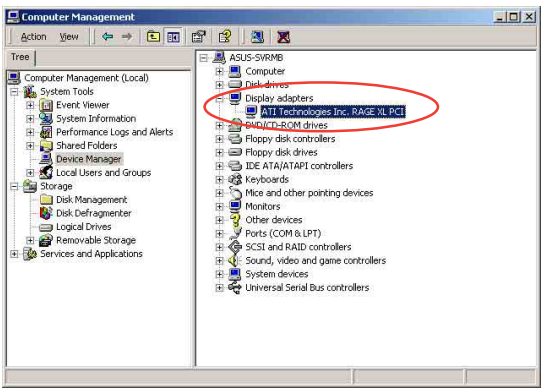
6.4.2 Windows® 2003 Server

The Windows® 2003 Server operating system automatically recognizes the ATI® RAGE XL VGA driver during system installation. There is no need to install an additional driver(s) to support the onboard VGA.

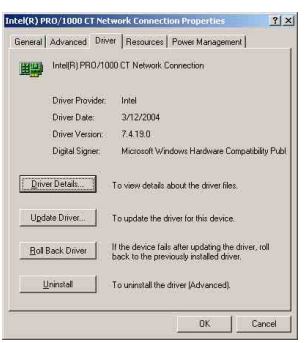
Verifying the VGA driver installation

To verify if the ATI® RAGE XL VGA drivers are properly installed in a Windows® 2000/2003 Server operating system:

1. Right-click the **My Computer** icon on the Windows® desktop, then select **Properties** from the menu.
2. Click the **Hardware** tab, then click the **Device Manager** button.
3. Click the "+" sign before the item **Display adapters**.
   The **ATI Technologies Inc. RAGE XL PCI** item should appear.



4. Right-click the **ATI Technologies Inc. RAGE XL PCI** item, then select **Properties** from the menu.
5. Click the **Driver** tab, then click the **Driver Details** button to display the VGA drivers.
6. Click **OK** when finished.



6.4.3 Red Hat® Linux 9.0

The Red Hat® Linux 9.0 (2.4.x kernels) operating system automatically recognizes the ATI® RAGE XL VGA driver during system installation. There is no need to install an additional driver(s) to support the onboard VGA.